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## RESEARCH REPORT

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# Impact of Electronic Commerce on Enterprise Applications





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# **Impact of Electronic Commerce on Enterprise Applications**

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Cornwall House  
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400 Frank W. Burr Blvd.  
Teaneck, NJ 07666  
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24, avenue du Recteur  
Poincaré  
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Tel: +33 (1) 46 47 65 65  
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### San Francisco

1881 Landings Drive  
Mountain View  
CA 94043-0848  
U.S.A.  
Tel: +1 (415) 961-3300  
Fax: +1 (415) 961-3966

### Tokyo

Saida Building, 4-6,  
Kanda Sakuma-cho  
Chiyoda-ku, Tokyo 101  
Japan  
Tel: +81 3 3864-0531  
Fax: +81 3 3864-4114

### Washington, D.C.

1921 Gallows Road  
Suite 250  
Vienna, VA 22182 3900  
U.S.A.  
Tel: +1 (703) 847-6870  
Fax: +1 (703) 847-6872

# Abstract

Electronic Commerce has become a subject that has enjoyed explosive growth in recent times. This study is focused on the impact of Electronic Commerce on Enterprise Applications.

Increasing competition in conjunction with change in the business models that define the relationships between vendors, their suppliers, and their customers are driving the interest in Electronic Commerce. The users surveyed in this study anticipate deriving significant benefits from Electronic Commerce, including

- Lower Operating Costs
- Competitive Advantage
- Global Reach
- Customer Management

The principal issue addressed in this study is how enterprise can best go about obtaining a strategic advantage based on using Electronic Commerce-based technologies and opportunities.

Published by  
INPUT  
1881 Landings Drive  
Mountain View, CA 94043-0848  
United States

## **Electronic Commerce Program**

### ***Impact of Electronic Commerce on Enterprise Applications***

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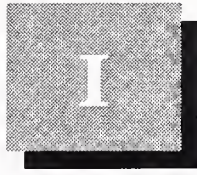
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# Introduction

## A

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### Scope and Objectives

The entire area of Electronic Commerce has exploded in recent years, and although it is still in its infancy, analysts and vendors have been predicting that this market will continue to grow and expand, and have significant impact on business functions throughout the enterprise.

This report focuses on the perspective of the users. The objectives of this study were to identify and analyze their issues, experiences, and perspectives related to Electronic Commerce and its current or planned integration with Enterprise Applications. Specific “User” issues addressed include:

- Objectives from integrating Electronic Commerce and Enterprise Applications
- Experience and satisfaction with use of Electronic Commerce
- Perspectives on Electronic Commerce, Enterprise Software and Integration Services vendors
- Budget allocations and identification of skills and needs, and how users plan to address these (in-house, external vendors, both)
- Advice to users who are planning integration and to vendors participating in the Electronic Commerce marketplace.

**B**

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**Methodology**

INPUT conducted extensive interviews with business function representatives responsible for Electronic Commerce in 210 organizations. (197 are currently integrating Electronic Commerce, and the remaining 13 are planning to do so in the near future).

The organizations represented in the interviews included Manufacturing / Distribution, Retail Trade, Services, Transportation and Utilities industries in the United States, and Manufacturing / Distribution, Retail Trade, Services, Transportation, Automotive, Healthcare, Government, and Utilities in the United Kingdom, France and Germany.

The Appendix includes the research questionnaire.

The breakdown of the sample by industry is shown in Exhibit I-1.

## Exhibit I-1

## Sample Breakdown by Industry

INDUSTRY	Count U.S.	Count Europe
Discrete Manufacturing	30	11
Process Manufacturing	28	33
Wholesale Distribution	31	15
Retail Trade Industry	12	5
Services	8	4
Utilities	4	1
Automotive		4
Government		4
Healthcare		2
Transportation	2	2
Other	12	2
<b>TOTAL</b>	<b>127</b>	<b>83</b>

**C****Report Structure**

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Chapter II consists of the Executive Summary, which is a summary of some of the key areas of the research. This section also provides INPUT's definition of Electronic Commerce and includes some background on this market.

Chapter III identifies and analyzes User Experiences and Plans, including:

- Business Functions Automated by Enterprise Applications
- Penetration of Electronic Commerce in Business Processes
- Business Functions and Processes Impacted by Integration
- Integration Objectives
- User Satisfaction with Integration
- Integration Skill Requirements
- Costs of Integration
- Leading Products and Services Vendors
- Lessons Learned and Advice

Chapter IV specifically looks at user experiences and plans in the Manufacturing / Distribution and Retail Trade Industries.



**D**

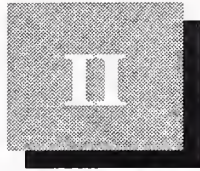
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**Related Reports**

Other INPUT reports that address topics related to the subjects discussed here include the following:

- *Evaluation of Enterprise Application Solutions, Europe*
- *Electronic Commerce, Markets and Forecast 1995 - 2000*





# Executive Summary

## 1. Definition of Electronic Commerce

INPUT defines Electronic Commerce (EC) as the use of information technology (IT) systems to carry out the inter-organizational business processes of buying and selling goods and services. Simply defined, it is a means of transacting business electronically, and in many cases, over the Internet. It involves a composite of technologies, processes and business strategies that foster the instant exchange of information within and between organizations, buyers and sellers. Included in this definition of Electronic Commerce are the traditional “older” technologies of Electronic Data Interchange (EDI) and e-mail, and the “newer” Internet Commerce (IC), Extranet, and Web capabilities.

- EDI is the direct, application-to-application transmission of business documents, primarily to trading partners. It is the cornerstone of business-to-business EC for many organizations. It operates via the transmission of paperless, computer-readable business documents electronically between trading partners and business systems.
- Internet Commerce involves the use of the Internet or World Wide Web for “value” transactions and electronic commerce services. It addresses the needs of both business-to-business and business-to-consumer transactions.
- When a company shares its Intranet with its suppliers and customers, they have in essence created an Extranet (typically a business-to-business network operating over the Internet).

For some companies, EC is nothing more than financial transactions that use information technology.

For virtually all of the users interviewed for this project, EC extends the value chain beyond the corporate boundaries and encompasses the full supply chain / product life cycle / sales cycle. It includes the use of information technology for EDI, customer and product databases, electronic funds transfers, value-added networks, interactive voice-response customer service systems, sales and marketing on the internet, electronic catalogs, and basically anything simultaneously involving technology and business or commerce.

## **2. What is driving the tremendous interest and growth in electronic commerce?**

Intense business competition, technology, changes in the marketplace, and pressures from customers and suppliers are driving businesses to overhaul the way that they have been doing business, and driving the interest in electronic commerce.

Vendors, manufacturers, distributors and suppliers are looking to electronic commerce to help them create new revenue streams, open new markets and retain current clients. They are specifically expecting to see benefits of a lower operating cost, competitive advantage, global reach, and customer management. They are looking to it as a necessary aspect of doing business in the future.

“Find me a business not on or planning to get on the Web, and I’ll show you a business out of touch with the future.” (Michael Dell, CEO, Dell Computer Corporation)

Or as Ira C. Magaziner, Sr. Advisor to the President for Policy Development, told Anne Stuart of CIO Magazine:

“The exact effect (of EC) will differ from industry to industry, but it will be profound. Companies need to study this and to form strategies about how they’re going to move into the digital age. In some companies, it may mean developing ways to manage their costs, their purchasing, their production planning or whatever on the Internet. For still others, it may mean reorganizing their work processes to take advantage of the new technologies. But (in every case), its going to be something significant. And the companies that don’t do this are going to find that their competitors do and that they’re going to be at a competitive disadvantage.” (CIO Magazine, 4/1/98)



**A**

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**Integration of Electronic Commerce Transactions and Business Functions****1. Strategic Advantage or Price of Entry**

Businesses today are faced with more competitive pressures than ever. They are under unrelenting pressure to reduce costs, yet balance this with the need to remain responsive to customers and suppliers. Now more than ever before, businesses are faced with the challenge of having to address the question – “am I a business that is easy to do business with?”

This pressure, combined with the significant growth in electronic commerce, has driven businesses to recognize the need to automate and coordinate the flow of information between front-end and back-end areas of the business.

Most savvy organizations are integrating their existing enterprise applications with electronic commerce transaction capabilities in order to:

- fully leverage their current investment in existing business systems
- manage the flow of business transactions internally and externally across their customer and supply chain
- become more “customer centric”
- become what has identified as the “next generation enterprise”
  - the cybercorp – one that relates to its customers, suppliers, and partners via electronic means

Integrating electronic commerce transactions with enterprise wide functions allows businesses to expand operating efficiencies beyond the enterprise. Organizations are now expecting this integration to not only help them “extend the enterprise”, but to be the “price of entry” – the strategic weapon in the arsenal of those enterprises seeking to gain a competitive advantage in a global economy that demands efficiency and rapid adjustment to market changes. The majority of organizations surveyed are already doing this, and those that are not are investigating or planning this integration in the near future.

## 2. Enterprise-wide Applications In Use

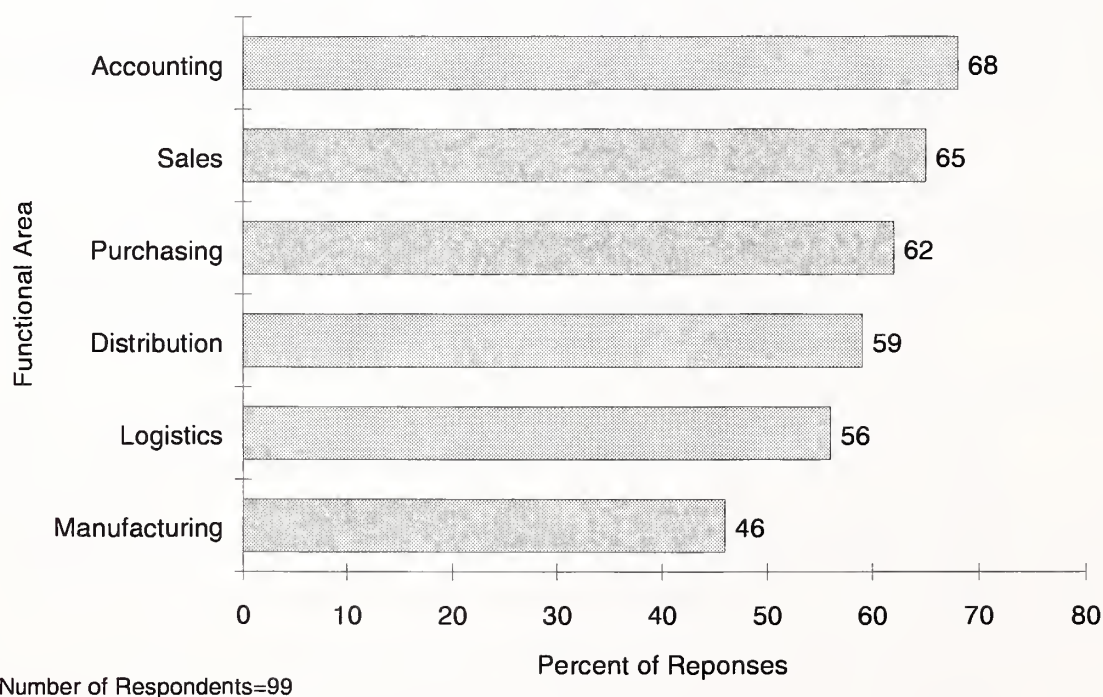
Enterprise-wide applications (EAS) are typically client server applications that span the enterprise, including financials/accounting, human resources, manufacturing, supply chain and customer management modules. They are widely used to link supply chains and partners, and lend themselves readily to electronic commerce. The larger, better known vendors include Baan, J.D. Edwards, Oracle, PeopleSoft and SAP.

All companies surveyed use some form of enterprise wide application, either developed in-house, or purchased from a vendor.

Exhibit II-1 shows the functional areas in which these systems are in use in the organizations surveyed.

Exhibit II-1

### Enterprise-wide Management Application Usage



Source: INPUT

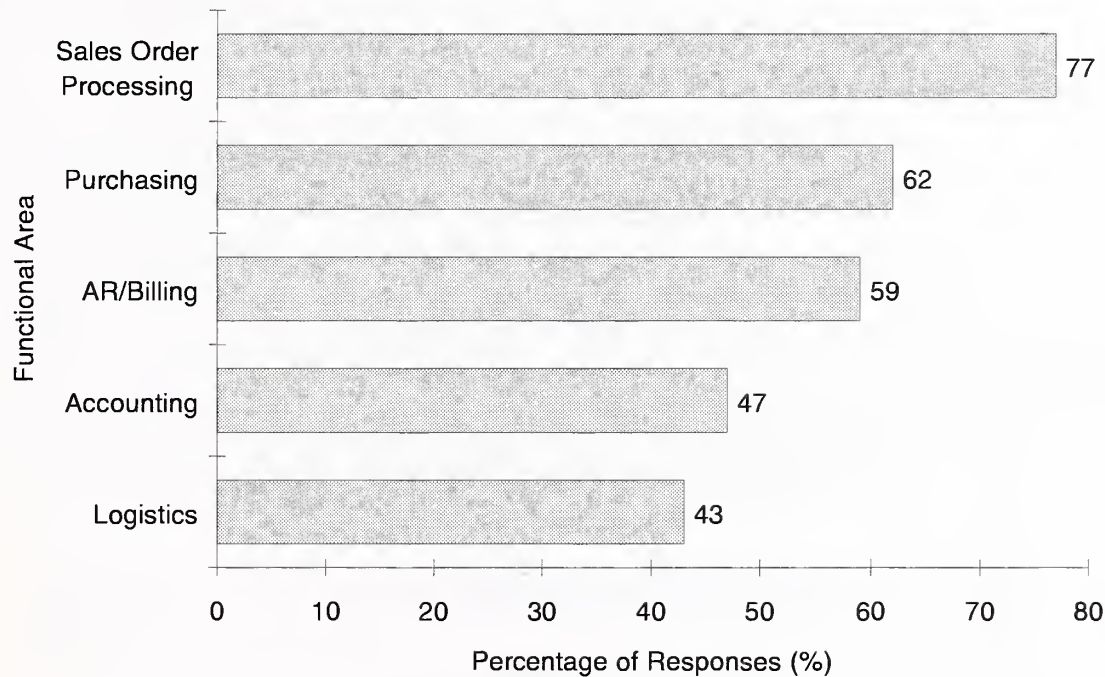
While the range of modules used tends to be determined to a certain extent by the industry sector in which the buyer operates, the most widespread implementation of enterprise application software was in the areas of accounting/finance, sales order processing, purchasing, distribution and logistics.

### 3. Integration of Business Functions with Electronic Commerce

Exhibit II-2 shows the functional areas where users are already processing electronic commerce transactions.

Exhibit II-2

#### Functional Areas That Process Electronic Commerce Transactions



Source: INPUT

The highest percentage of responses was in the integration of sales order processing with electronic commerce capabilities. Users defined this area very broadly as anything related to getting and processing an order - purchase orders, order schedules, order entry, invoices, acknowledgements, confirmations, etc.



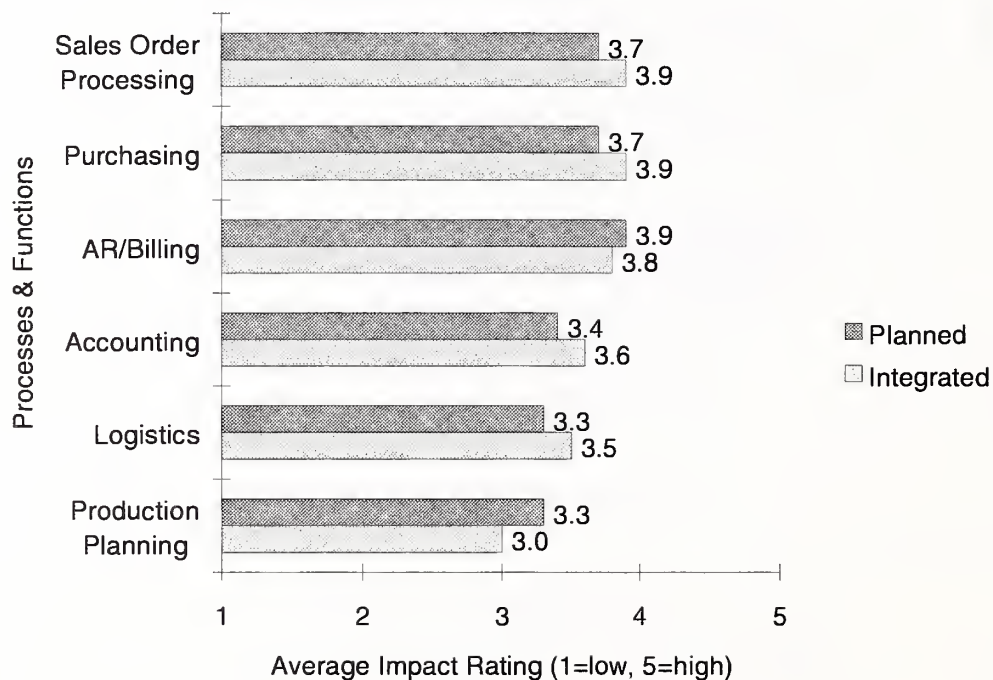
#### 4. Impact of Electronic Commerce on Business Functions

The main question for everyone looking at the electronic commerce marketplace is “what business functions are being seen as important or necessary to integrate with electronic commerce capabilities?”

Exhibit II-3 shows the importance users attach to the impact (degree of importance) of the integration to the business function. Also shown is the ranking of users that have already integrated the business function with electronic commerce, contrasted with the expected impact of the respondent group planning to integrate.

Exhibit II-3

#### Business Processes and Functions Impacted



Source: INPUT

Users were clearly expecting electronic commerce to impact a wide range of enterprise application functions.

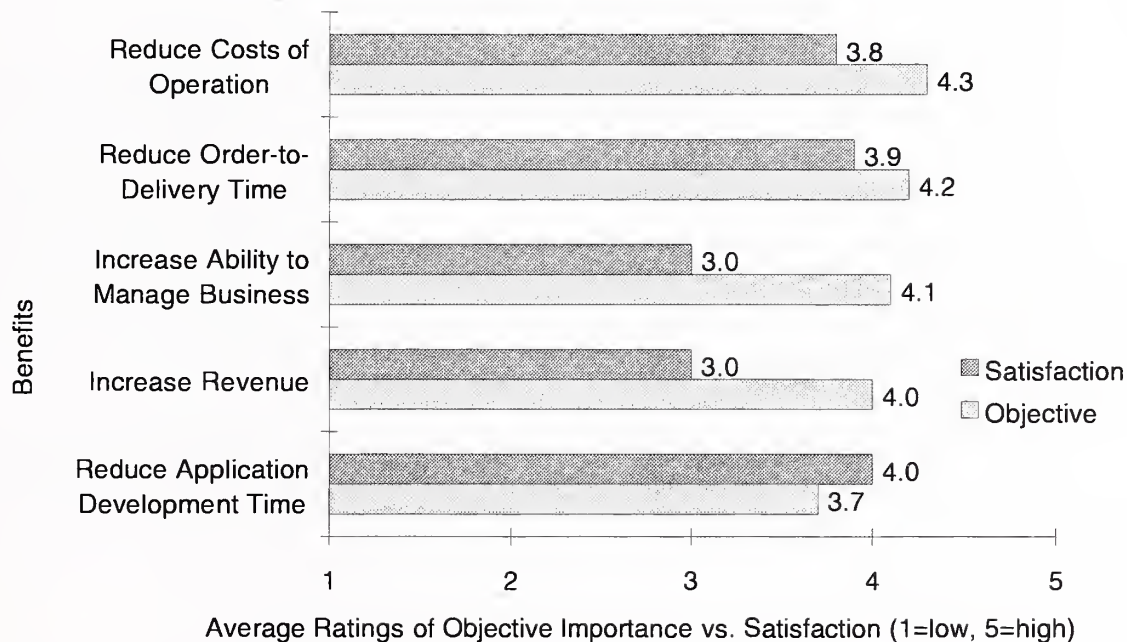
#### 5. Benefits of Integration

To understand why there is such intense interest in electronic commerce, one must understand and appreciate the benefits businesses and customers expect to achieve.

Exhibit II-4 identifies the importance of expected benefits associated with integrating electronic commerce and enterprise applications, and the satisfaction associated with realizing these benefits.

Exhibit II-4

### Benefits of Users Already Integrating EC with EAS



Source: INPUT

As can be seen in Exhibit II-4, the most highly rated anticipated benefits for integrating electronic commerce and enterprise application software were the potential to reduce overall cost of operations and reduce the overhead costs of order-to-delivery, but managing the business and increasing revenues by extending potential markets followed close behind.

But with the focus of profit generation shifting from cost reduction to revenue growth, electronic commerce integration is seen as a top line initiative to win new business, retain existing relationships, expand into global markets, and improve the competitive advantage. This was actually reflected in the rankings of those users planning to integrate. For those users, "increasing the ability to manage the business" ranked higher than "reducing order-to-delivery time".



**a. Satisfaction Levels**

Overall, satisfaction levels with the expected benefits of integrating electronic commerce with enterprise applications were modest. INPUT considers a score of 3.9 or above to indicate a high level of satisfaction. Only two areas had satisfaction levels of 3.9 and above – reduced order-to-delivery time and reduced application development time.

**b. Comparison**

The difference between satisfaction levels and importance levels were significant. For example, users attributed an importance level of 4.1 to increasing their ability to manage the business, and a satisfaction level of 3.0 with this perceived benefit. Much of this relative dissatisfaction can be explained by the fact that many of the business functions related to this are typically the last to be integrated, i.e. sales forecasting, sales force automation, and data warehousing / analysis applications, and thus the full benefits of integration have not yet been achieved.

Even though satisfaction with achieving the benefits did not reach the anticipated level, 90% of the users interviewed plan to do additional integration projects.

**B****Integration Concerns**

Users that have not yet integrated but plan to do so are shown in Exhibit II-5.

Exhibit II-5

**Prospects' Integration Concerns**

<b>Key Concern</b>	<b>Rank</b>
Security	1
Reliability	2
EDI Issues	3
Speed/Timeliness of Integration	3
Process	4

*Source: INPUT*

**1. Security**

The leading concern users had was security of information / security risks and reliability, primarily related to the Internet. Most of these concerns were not related to EDI, because there was the belief that VANs, direct connections and private networks, and security mechanisms built into EDI transactions were adequate protection.

Users need to verify whether this concern is real, and vendors need to help users address this concern, much of which might be irrational due to media hype. Today, the software-based protocols, encryption technologies and firewall security that are in virtually guarantee an adequate level of security.

In general, in the business-to-business EC environment, security is less of a problem than business-to-consumer. In business-to-business commerce, users know whom they are dealing with. They usually have a small number of "partners" and fewer transactions. When working with suppliers, distributors and other business partners, they can usually make assumptions about their partners technology base, connectivity, and response time. On the other hand, in business-to-consumer, one does not know whom or what one is dealing with.

## **2. EDI**

EDI Issues and Speed/Timeliness of Integration were tied as the next major areas of concern. There exists a lot of confusion and fear over EDI.

Some of the confusion was related to misconceptions and a lack of understanding related to EDI. There still exists a lack of awareness that most of the service providers offer programs designed to assist companies with communicating with non-EDI trading partners.

## **3. Speed / Timeliness**

In the area of speed/timeliness, the concerns were primarily related to the process of implementation. This might be due to the reality that many of the existing enterprise applications cannot support interactive EC because they are comprised of a variety of incompatible hardware, software and data descriptions. Because they were intended to link application systems across enterprise boundaries, many existing infrastructures were designed to support only certain EDI batch exchanges and data translations. Such enterprise applications cannot be used as a foundation for an EC infrastructure that must link web-based EC and traditional transaction processing systems. Thus, the greatest fear is that of replicating the length of time that re-engineering / implementation of enterprise systems has been known to take.

## **4. Process**

There was valid concern that the network, systems and applications management challenges of electronic commerce would be radically different than those of either client/server or the mainframe.

## **5. Summary**

All of these concerns appear to be examples of having a fear of the unknown, as none of the companies that had completed the integration exercise mentioned these as issues or areas in which they should have acted differently.

However, these concerns should not be dismissed. Instead, they must be incorporated into the planning process, and potential vendors should be asked to explain how their solutions overcome these concerns.

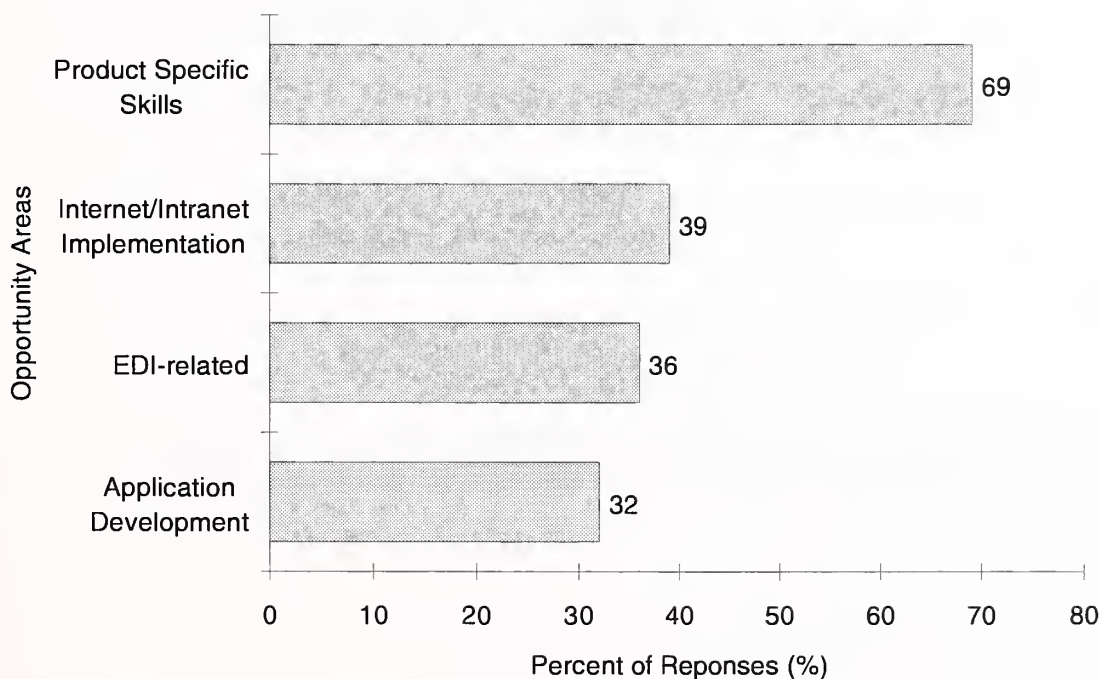
**C****Areas Where Users Want Assistance**

Users were asked about the skills that they felt were required for the integration of electronic commerce and business functions, and whether they would use in-house resources or an external vendor to supply those skills.

For the most part they felt that their in-house resources were strong, in particular in application development and weak in product knowledge and internet/Intranet implementation. However, virtually all users stated that they would not go it alone – that they would use a vendor, either exclusively or in combination with in-house resources.

They identified several opportunities for vendor assistance, as shown in Exhibit II-6.

Exhibit II-6

**Integration Opportunities**

Source: INPUT

In the areas that they said they would use a vendor, Product Specific Assistance received the greatest percent of responses (69%). Users did not have third party product experts in-house, and if they did, they were usually for only one application module.

The need for vendor assistance with Internet/Intranet implementation (39%) and EDI-related activities (36%) did not come as a surprise given the fears and concerns that the users had expressed in this area.

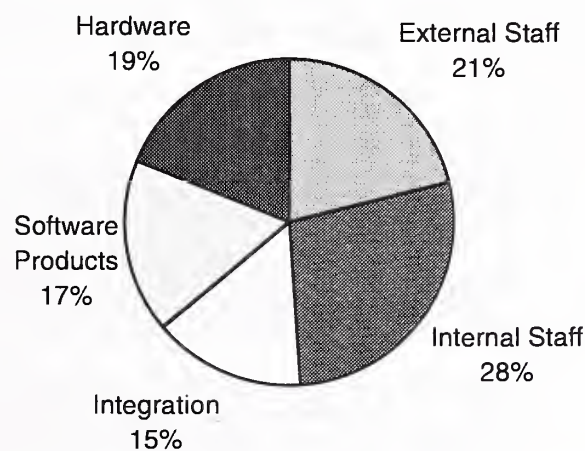


**D****Expenditures on EC/EAS Integration****1. Budget Allocations**

How are budgets being allocated? Exhibit II-7 shows the breakdown of budget allocations for staffing, products and integration.

Exhibit II-7

**Budget Allocations**



Source: INPUT

Significant expenditure was planned for both products and external services. The expectation was that these percentages would continue to increase.

## 2. Expenditures

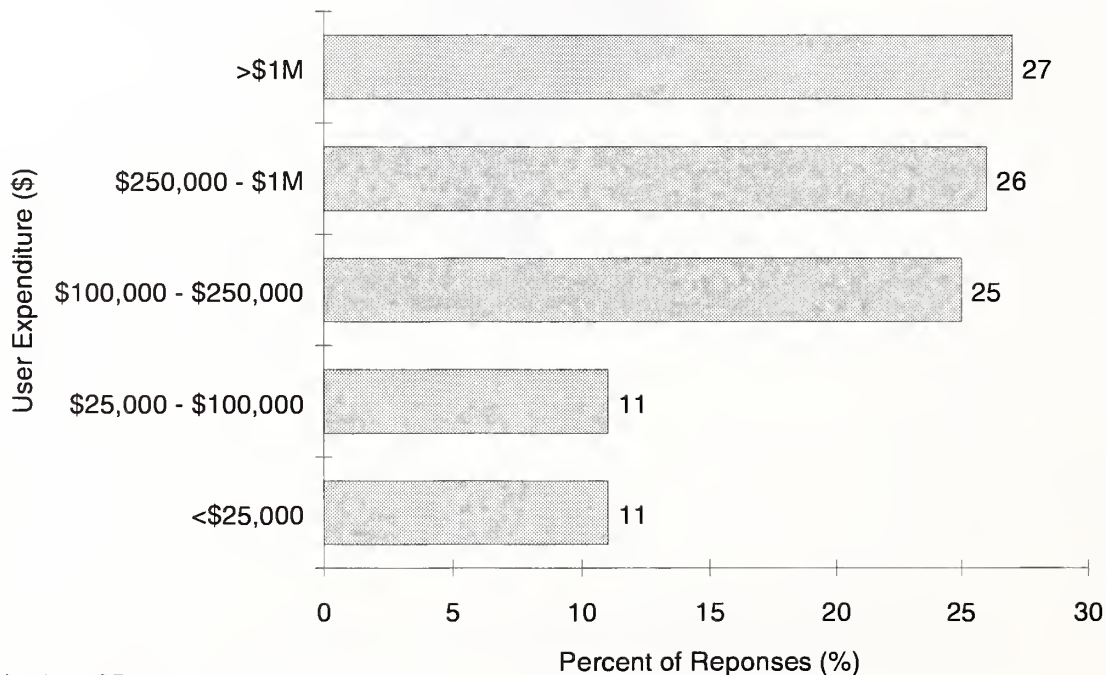
Integration was not cheap. 27% of the users interviewed spent more than \$1M, and many said that it would be a continuing project - an "ongoing sinkhole".

Integrating these applications ranged from under \$100K for the initial integration of one or two types of EC transactions, to several hundred million dollars for \$1B+ size organizations.

Exhibit II-8 shows the range of expenditure cited by the users surveyed.

Exhibit II-8

### Total Expenditures on Integration of EC and EAS



Source: INPUT

## E

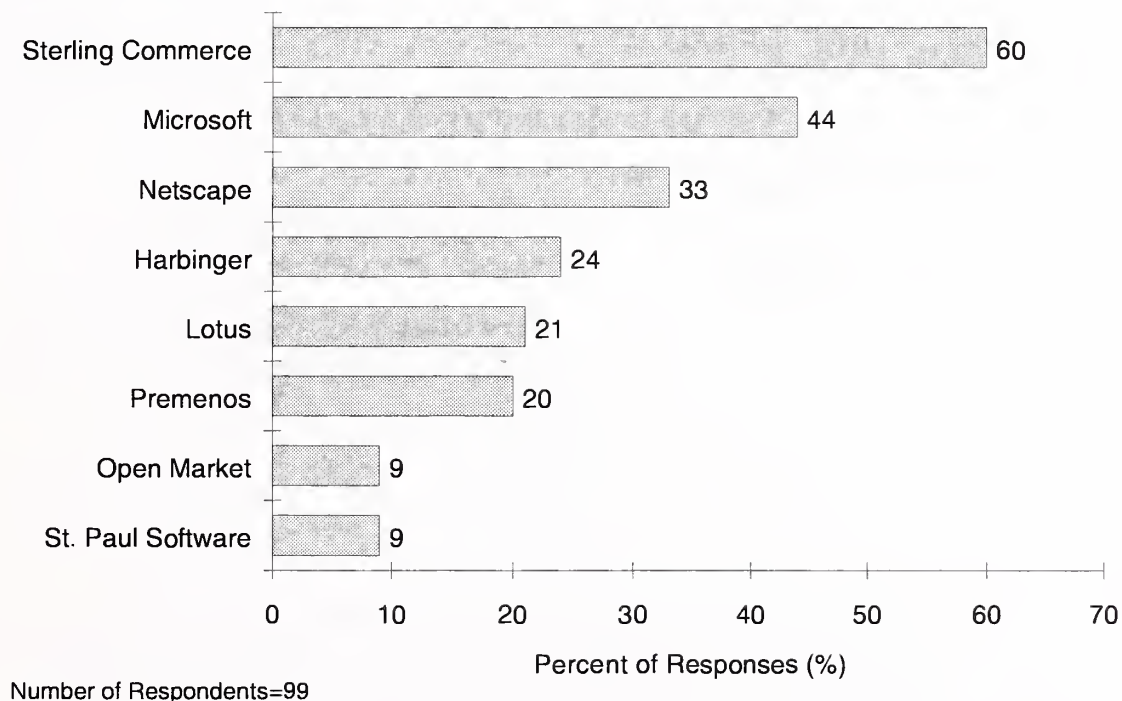
## Leading Technology Vendors

When asked which of the following technology vendors they anticipated using over the next three years for “electronic commerce” applications, users named Sterling Commerce, Microsoft, Netscape, Harbinger, Lotus and Premenos the most often.

Exhibit II-9 shows the percentage of responses vendors received.

Exhibit II-9

### Most Frequently Mentioned Electronic Commerce Vendors



Source: INPUT

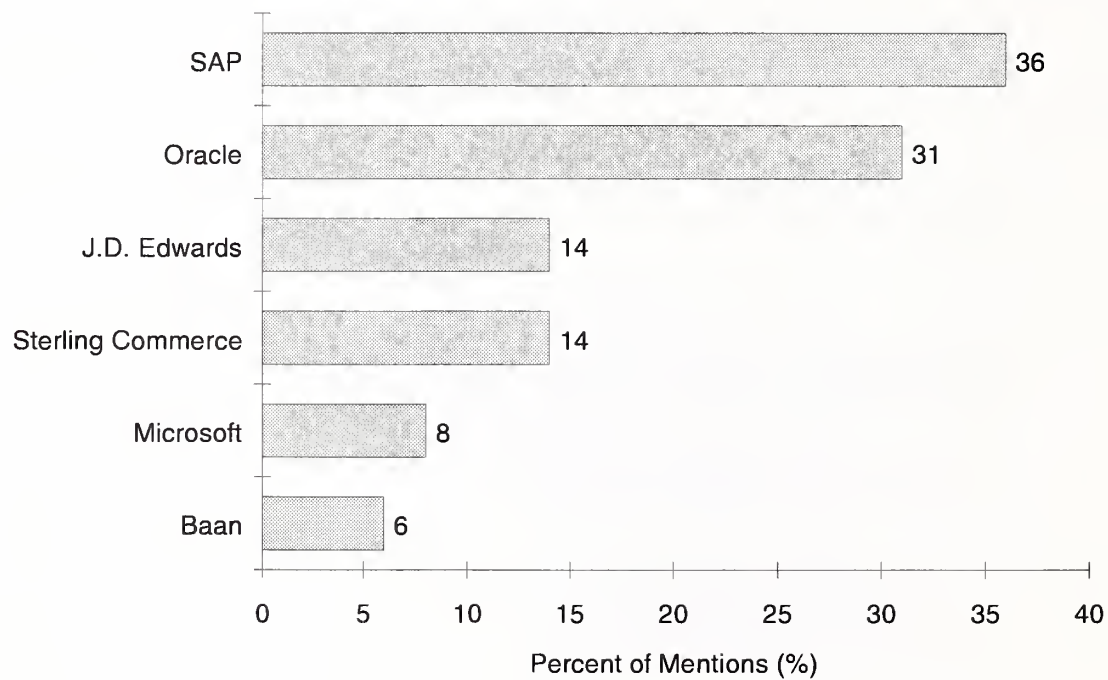
The vendors run the gamut of EDI/EC software players and VANS, commerce platform component vendors, and server vendors, which reflects part of the problem in this area – users are confused as to which vendor to call in for what and when.

However, the good news is that there is opportunity for everyone. The constantly changing technology will drive users into the arms of a plethora of vendors.

The users were asked to name who they perceived to be the leading vendors of EAS software, and whom they would use. This is show in Exhibit II-10.

Exhibit II-10

### User Perception of Leading EAS Vendors



Source: INPUT

Users ranked SAP and Oracle as the clear leaders. What is interesting is that they included Sterling Commerce and Microsoft, neither of which the marketplace or industry analysts would put in this category.

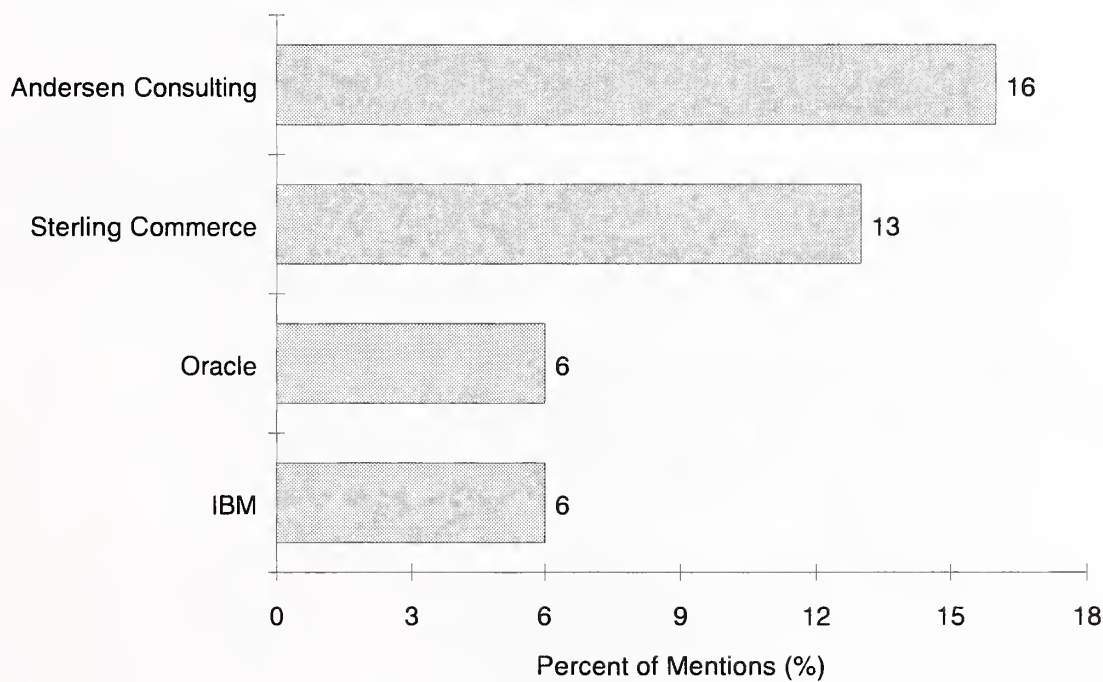


When asked who they believed to be the three leading vendors for integrating electronic commerce and enterprise applications, they turned to the Big Six as Number 1. Andersen Consulting received the greatest number of mentions, followed by Sterling, IBM and Oracle.

Exhibit II-11 shows how the users ranked the vendors.

Exhibit II-11

### Leading Integration Vendors



Source: INPUT

Andersen Consulting was cited for overall systems integration. Both Andersen and IBM were seen as offering “soup to nuts” capabilities.



**F****User Advice to Vendors**

The topic that was voiced the most frequently was in the area of vendor knowledge. There was a general sense that vendors are not up to speed on EC, and that vendor sales people do not have the knowledge to sell the products and services that they are being asked to call.

Exhibit II-12 highlights the recommendations the users had for vendors.

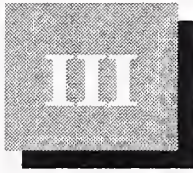
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Exhibit II-12

**User Recommendations for Vendors**

- Salespeople/vendors should be more technical; know product better
- Need better understanding of importance of EC and results it can achieve
- Provide more and better training
- Offer more complete solutions
- Make documentation easier to understand
- Provide more support/continuous helpline
- Develop more flexible applications
- Create more robust products
- EDI capabilities
- More standardization
- Be more results-oriented; base development on customer requirements

*Source: INPUT*



## User Experiences and Plans

### A

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#### Enterprise-wide Applications in Use

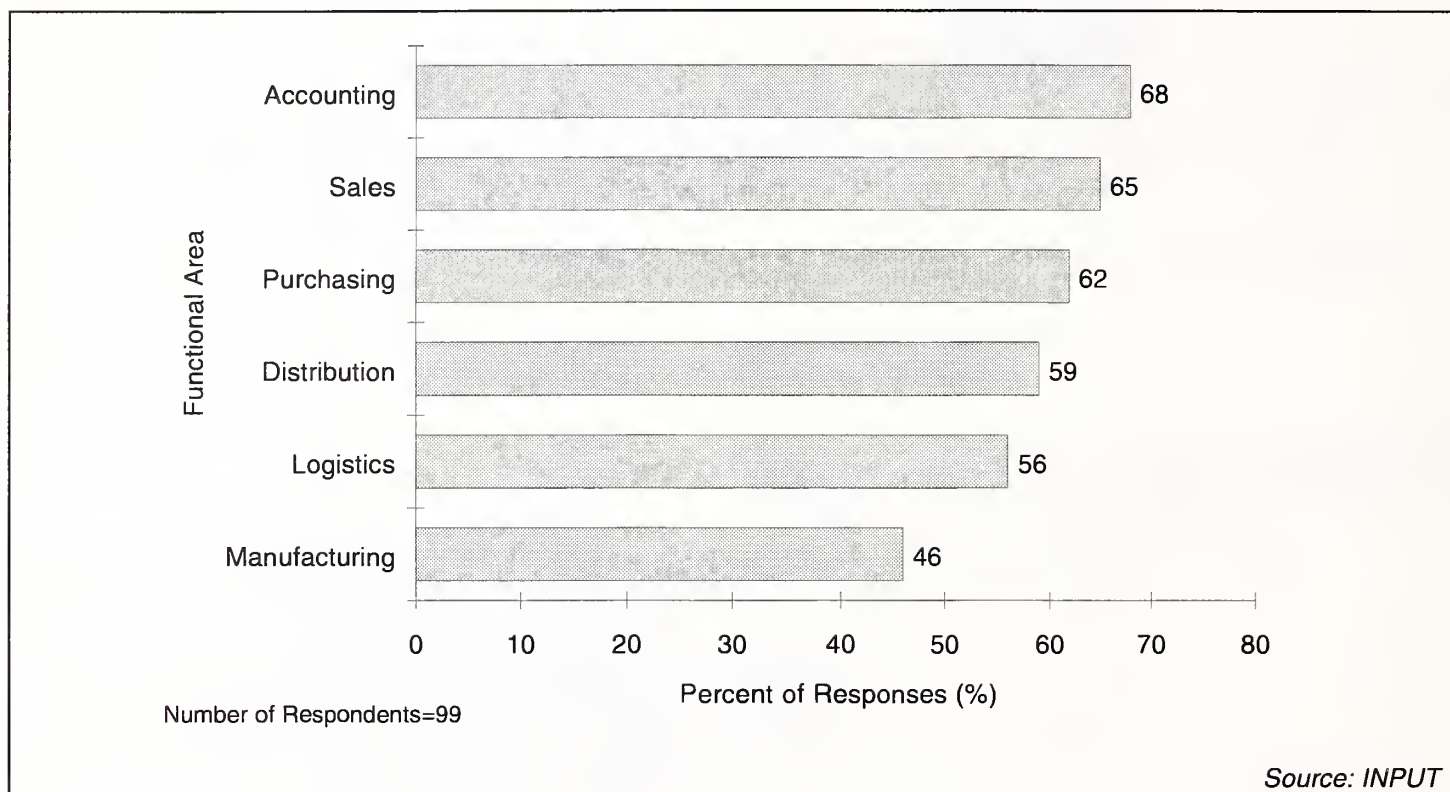
Enterprise-wide applications (EAS) are typically client server applications that span business functions across the enterprise. These applications, which are often referred to as Enterprise Resource Planning (ERP) software, have traditionally linked the “back-office” functions of finance/accounting, human resources, and manufacturing. The larger, better known vendors include Baan, J.D. Edwards, Oracle, PeopleSoft and SAP.

Almost every EAS/ERP vendor has added the capability to extend functionality to cross enterprise application integration in readiness for electronic commerce, either through acquisition, in-house development, or partnership. For example, in order for their customers to be able to link supply chains, partners and customers, PeopleSoft acquired Red Pepper, Baan acquired Berclain, SAP is developing an in-house application called Scope, and J.D. Edwards is integrating with ILOG. The new capabilities of EAS applications now also include sales force automation, document management, customer support, customer management, data warehousing, and supply chain management.

All users interviewed, both in the U.S. and in Europe, use some form of enterprise-wide application software, either developed in-house or purchased from a vendor.

Exhibit III-1 shows the functional areas in which these systems are in use in the U.S. organizations interviewed.

Exhibit III-1

**Enterprise-wide Management Application Usage (U.S.)**

While the range of modules used tends to be determined to a certain extent by the industry sector in which the buyer operates, the most widespread implementation of enterprise application software was in the areas of accounting/finance (68%), sales order processing (65%), and purchasing (62%).

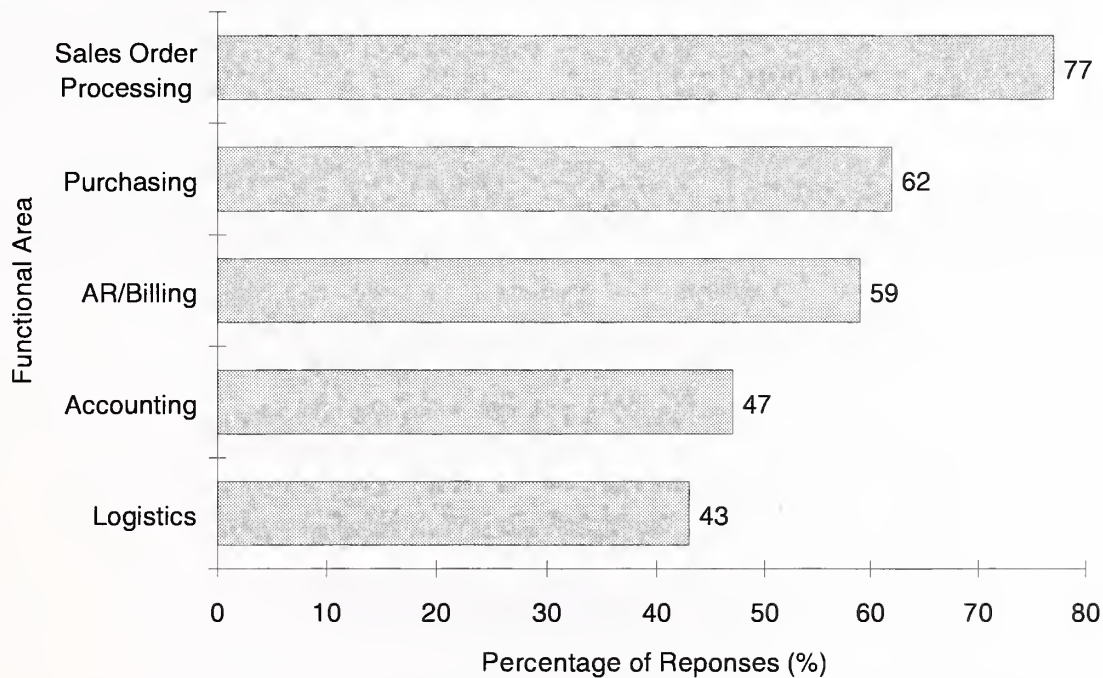
The same ranking was also true for those users interviewed in Europe, where the top three functional areas were accounting/finance (60%), sales order processing (50%), and purchasing (50%).

This is consistent with the enterprise application solution market, in which usage is typically dominated by financial / accounting modules.

**B****Integration of Electronic Commerce and Business Functions**

Exhibit III-2 shows the functional areas where users are already processing electronic commerce transactions.

Exhibit III-2

**Penetration of Electronic Commerce in Business Transactions**

Source: INPUT

“Orders” impact all areas of a business, and users defined this area very broadly as anything related to getting and processing an order - purchase orders, order schedules, order entry, invoices, acknowledgements, confirmations, etc. Overall, users are sharing information with their customers and suppliers:

- Suppliers checking on invoices
- Customers tracking orders
- Customers dialing in and extracting select information

Thus it comes as no surprise that the highest percentage of responses was in the integration of “Sales Order Processing” with electronic commerce capabilities, followed by “Purchasing”.



## C

## Impact of Electronic Commerce on Business Functions

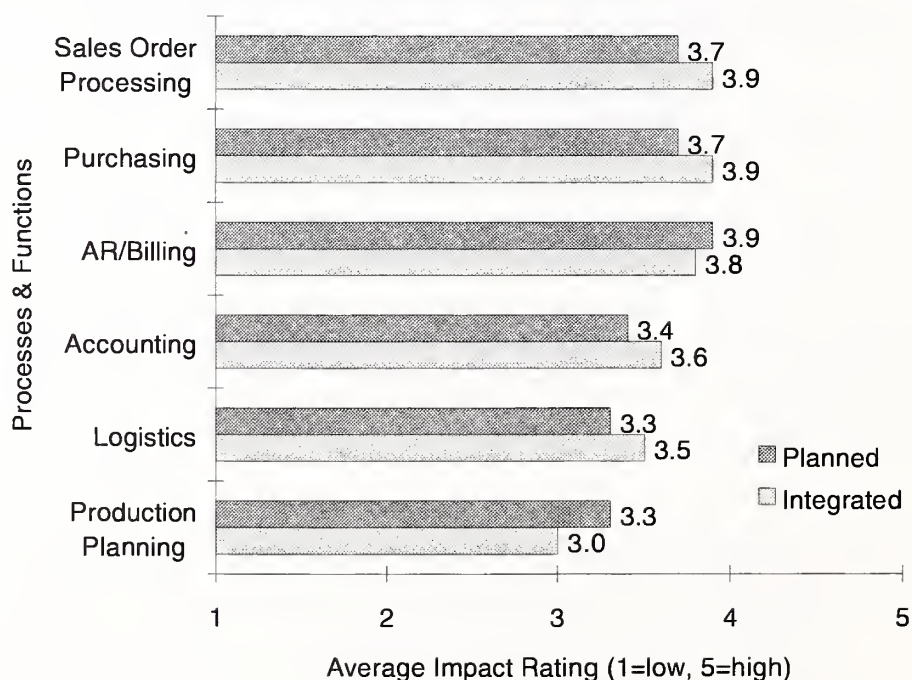
The question that is on top of everyone's mind looking at the electronic commerce marketplace is what business functions are being seen as important or necessary to integrate with electronic commerce capabilities.

Exhibit III-3 shows the importance U.S. users attach to the impact (degree of importance) of the integration to the business function.

Also shown is the ranking of users that have already implemented an integration of the business function with electronic commerce, contrasted with the expected impact of the respondent group planning to integrate.

Exhibit III-3

### Business Processes and Functions Impacted by EC (U.S.)



Source: INPUT

Users were clearly expecting electronic commerce to impact a wide range of enterprise application functions. Externally allowing them to share more information with customers, suppliers and trading partners, and internally providing better coordination of raw materials from suppliers and optimization of production schedules.



## 1. Already Integrated vs. Planning to Integrate

It should not be a surprise that for those that have already integrated EC with EAS, the areas that were considered to have high impact match those areas that were already integrated.

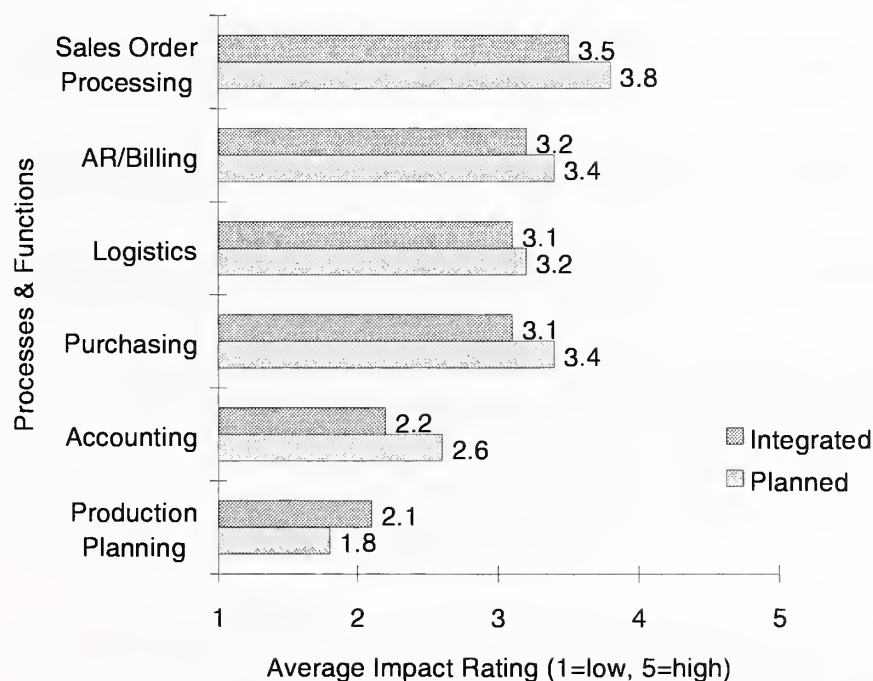
The users that are planning to integrate viewed “AR/Billing” as the area most impacted. This is probably due to the fact that finance/accounting is the most widely used enterprise application module.

## 2. Impact for Users in Europe

Exhibit III-4 shows the average impact rating given by users interviewed in Europe.

Exhibit III-4

### Business Processes and Functions Impacted by EC (Europe)



Source: INPUT

As did users in the U.S., users interviewed in Europe viewed “Sales Order Processing” as the business function most impacted by electronic commerce; but differed from their U.S. counterparts in considering “A/R Billing” versus “Purchasing” as the next most impacted function.

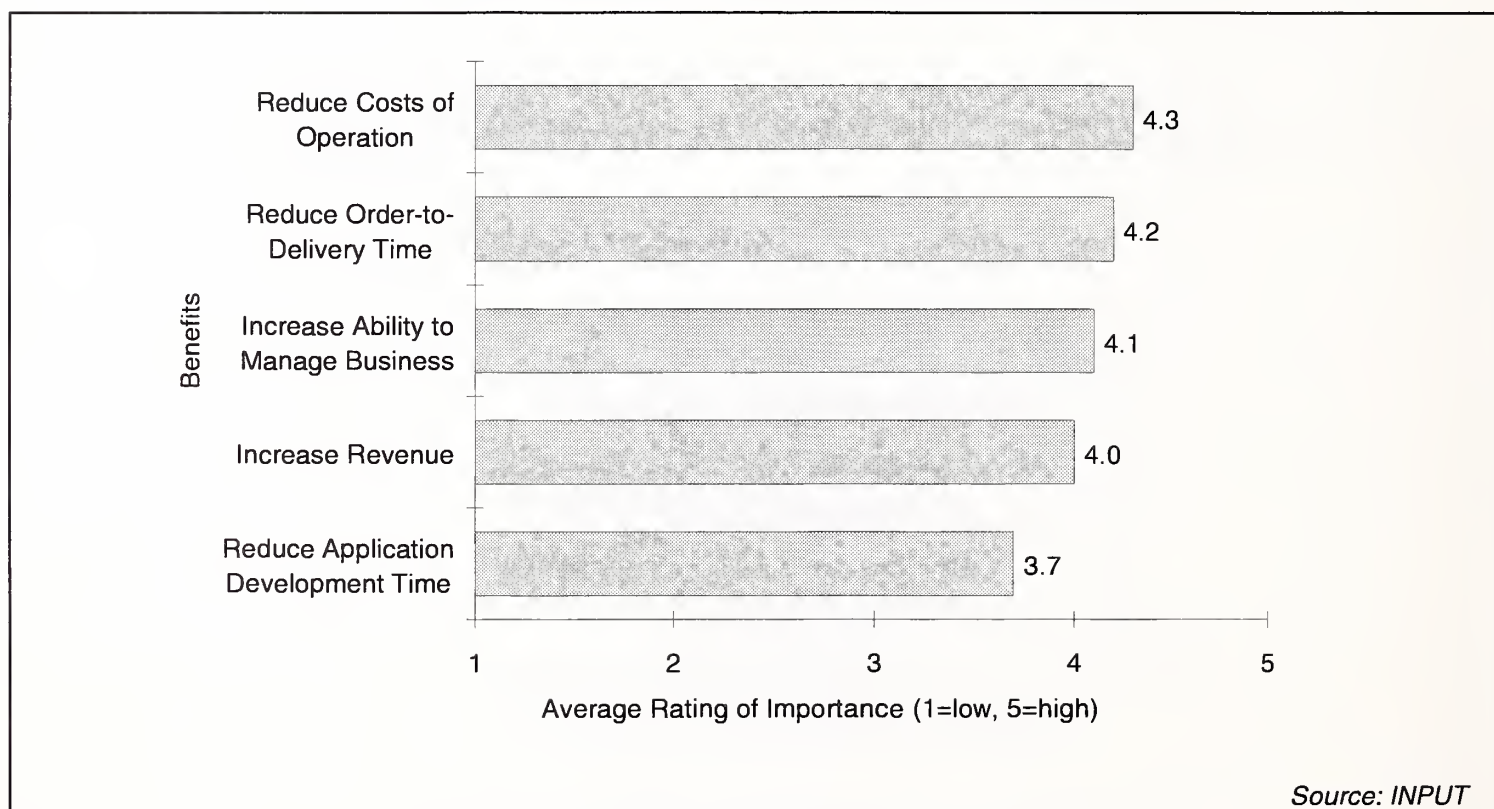
Among those users that are planning to integrate, “Purchasing” ties with “A/R Billing” as the second most impacted function.

**D****Integration Objectives**

To understand why there is such intense interest in electronic commerce, one must understand and appreciate the objectives / benefits businesses and customers expect to achieve.

Exhibit III-5 identifies, for U.S. users, the importance of expected benefits associated with integrating electronic commerce and enterprise applications.

Exhibit III-5

**Objectives / Benefits Expected with Integration (U.S.)**

As can be seen in Exhibit III-5, users surveyed still expect the traditional benefits of shorter cycle time, improved responsiveness to customers, and lower operating costs. The two most highly rated anticipated benefits for integrating EC and enterprise application software were the potential to “Reduce Overall Cost of Operations” and “Reduce the Overhead Costs of Order-to-Delivery”.

In fact, for over 80% of the organizations that integrated electronic commerce and enterprise applications, the potential to “Reduce the Cost of Operations” was viewed as a highly important benefit.

“The goal is a totally seamless operation with no paper.”  
(\$1.4B Wholesale Distributor)

### **1. Focus of Profit Generation is Shifting**

But the trend we are beginning to see is that the focus of profit generation is shifting from cost reduction to revenue growth - electronic commerce integration is seen as a top line initiative to win new business, retain existing relationships, expand into global markets, and improve the competitive advantage. And this was reflected by the users - “Managing the Business” and “Increasing Revenues” followed close behind in the importance rating for those users already integrated, and for those planning to integrate, “Increasing the Ability to Manage the Business” ranked higher than “Reducing Order-to-Delivery Time”.

### **2. “Disintermediation” Not a Concern**

What did come as a surprise was that “disintermediation” (decreasing costs from channel bypassing / cutting out the middleman), was not cited as an important benefit to be achieved. This runs counter to what many industry analysts and vendors have been reporting as a major benefit of electronic commerce integration with enterprise applications.

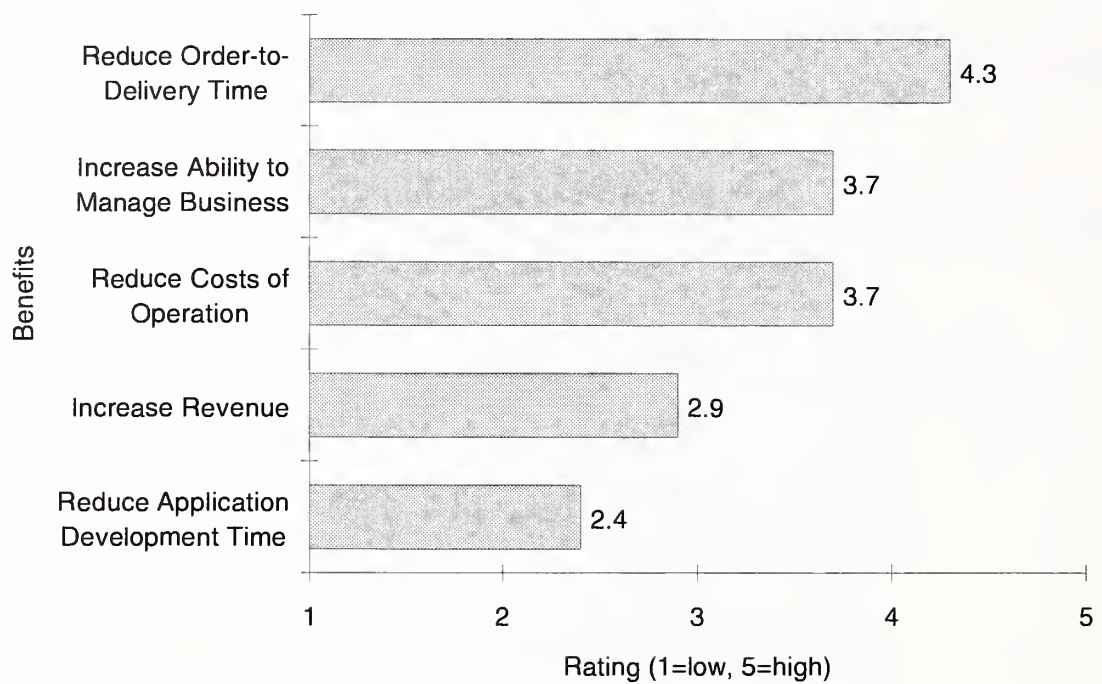
Users in organizations that developed in-house enterprise application software attached a lower importance to potential benefits than did those in organizations that purchase packaged applications. It appears that vendor marketing and sales organizations have done their jobs well.

### **3. Users in Europe**

Exhibit III-6 identifies, for users in Europe, the importance of expected benefits associated with integrating electronic commerce and enterprise applications.

For these users, “Reducing Order-to-Deliver Time” was seen as the most important objective.

Exhibit III-6

**Objectives / Benefits Expected with Integration (Europe)***Source: INPUT*



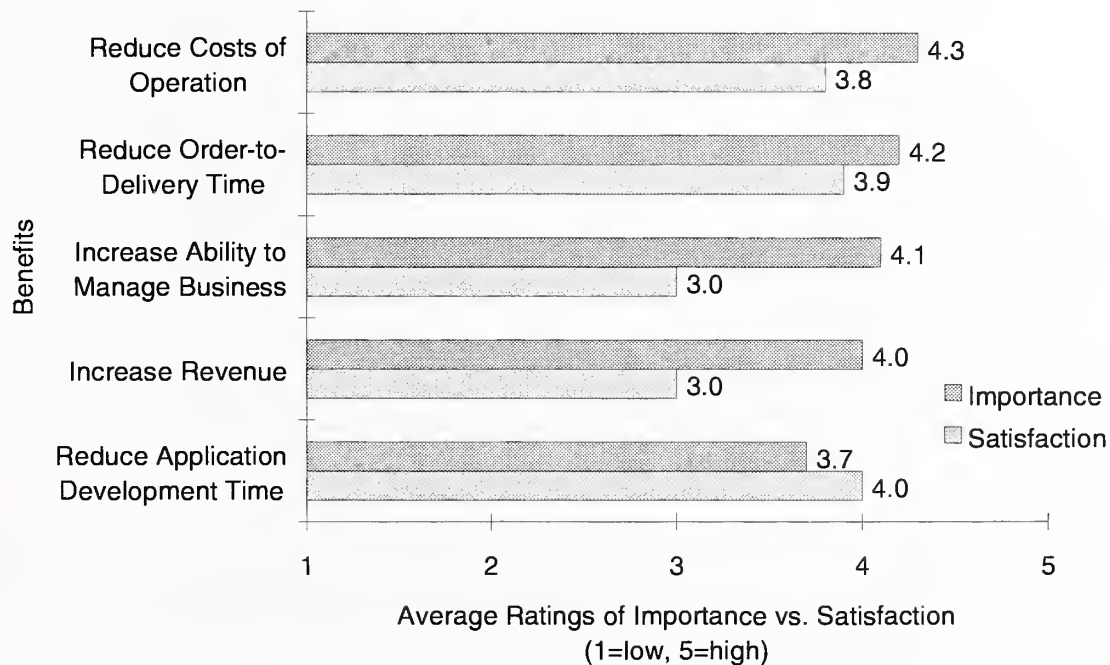
## E

## User Satisfaction with Integration

Exhibit III-7 identifies, for U.S. users, the importance of expected benefits associated with integrating electronic commerce and enterprise applications, and the associated satisfaction with realizing these benefits.

Exhibit III-7

### User Levels of Satisfaction (U.S.)



Source: INPUT

#### 1. User Satisfaction Levels

Overall, satisfaction levels with the expected benefits of integrating electronic commerce with enterprise applications were modest.

In the above chart, the margin of error is .1 for each rating, with a cumulative margin of error of .2 on all but “Reduced Application Development Time”, which is .3.

INPUT considers a score of 3.9 or above to indicate a high level of satisfaction. Only two areas had satisfaction levels of 3.9 and above – “Reduced Order-to-Delivery Time” and “Reduced Application Development Time”.

## 2. User Satisfaction vs. Importance

The difference between satisfaction levels and importance levels were significant. For example, users attributed an importance level of 4.1 to increasing their ability to manage the business, and a satisfaction level of 3.0 with this perceived benefit. Much of this relative dissatisfaction can be explained by the fact that many of the business functions related to this are typically the last to be integrated, i.e. sales forecasting, sales force automation, and data warehousing / analysis applications, and thus the full benefits of integration have not yet been achieved.

The only area where ratings for satisfaction exceeded expectations was in the area of "Reduce Application Development Time". Even with a larger margin of error, data still indicates that vendors are meeting user expectations and fulfilling their objectives in this category. This might be due to vendor marketing and industry awareness setting conservative expectations regarding application development time, combined with the fact that many vendor solutions are pre-packaged suites or bundles that are easily modifiable.

It is also possible, considering a cumulative margin of error of .2, that vendors are nearly meeting expectations in the area of "Reduce Order-to-Delivery Time".

It is in the areas of "Reduce Costs of Operations", "Improve Revenues" and "Improve Ability to Manage Business" that vendors need to work harder to help clients reach objectives while managing their expectations to more realistic levels.

Overall, those organizations that developed in-house enterprise application software were more satisfied that objectives were met. They attached a lower level of importance to each potential benefit, yet stated higher individual levels of satisfaction per benefit than did those that had purchased applications. It is not known whether the influence of vendor marketing raised buyers' expectations to an unattainable level, or it was "not invented here" syndrome.

Even though satisfaction with achieving the benefits did not reach the anticipated level, 90% of the users interviewed plan to do additional integration projects.

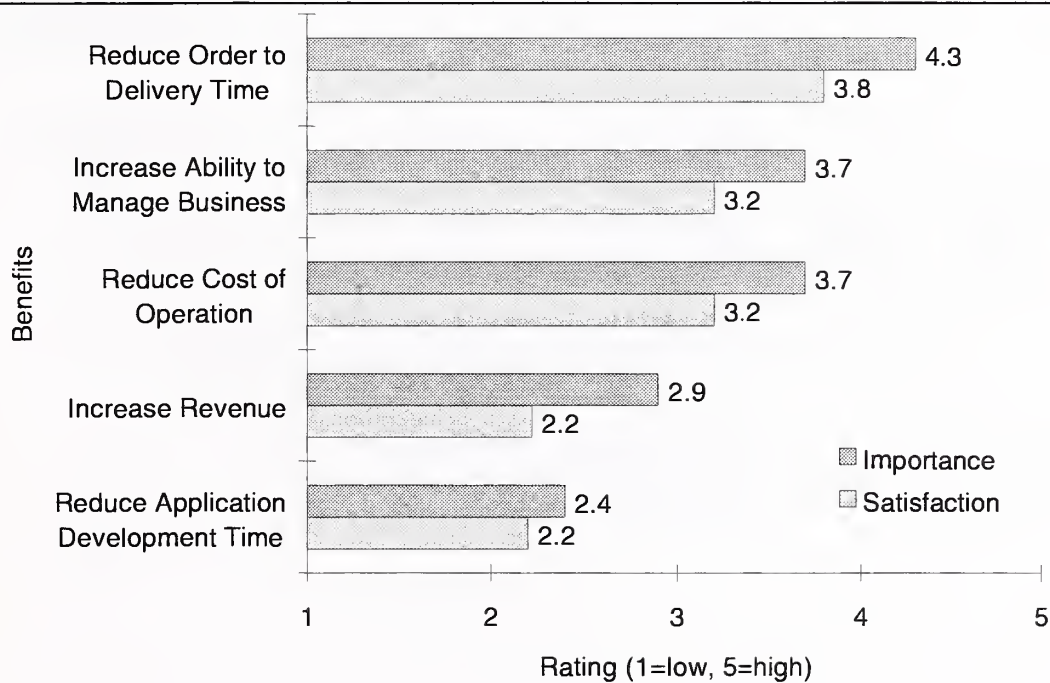
### 3. Europe

Users in Europe were very satisfied with their “Increased Ability to Manage the Business”, which exceeded their expectations and received a rating of 3.9.

Exhibit III-8 identifies the importance of expected benefits associated with integrating electronic commerce and enterprise applications, and the associated satisfaction with realizing these benefits.

Exhibit III-8

#### User Levels of Satisfaction (Europe)



Source: INPUT

## F

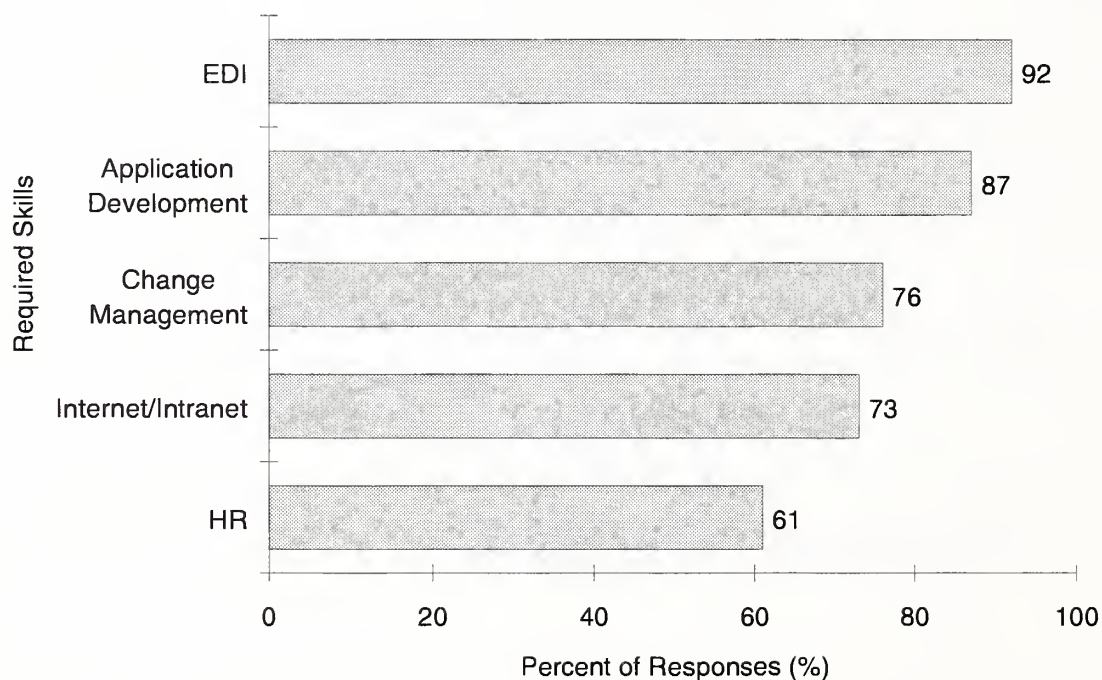
## Integration Skill Requirements

Users were asked to identify the skills that they felt were required for the integration of electronic commerce and business functions.

Exhibit III-9 shows the skills that users felt were critical to integration.

Exhibit III-9

### EC/EAS Integration Skills Required (U.S. & Europe)



Source: INPUT

As can be seen from the above chart, 92% of the users identified “EDI related” knowledge as most critical, with the next two most important skills as “Application Development” (87%), and “Change Management” (76%).

Users were also asked whether they would use in-house resources or an external vendor to fulfill these skills. Their responses are shown in Exhibit III-10.



Exhibit III-10

**Approach to Fulfill Skill Requirements**

<b>Skill Required</b>	<b>In-house (%)</b>	<b>External Vendor (%)</b>	<b>Both (%)</b>
Product Specific	31	38	31
Internet/Intranet	61	19	20
Human Resource	75	12	12
EDI	64	17	19
Application Development	60	12	17
Change Management	72	13	14

*Source: INPUT*

Users clearly would like to use in-house talent, especially for key strategic areas, yet doing so, especially in EC technology, could consume internal resources for months, if not years. Most companies cannot afford to devote the internal staff time and resources to completely manage the coordination, education and implementation tasks of EC integration.

And given the realities of the IT staffing shortage and the rate at which new products and technology are introduced, there exists a huge opportunity for software and services vendors, an opportunity greater than users would like to acknowledge.

## G

## Integration Concerns

Exhibit III-11 shows the concerns that prospective users had regarding electronic commerce and the integration process.

Exhibit III-11

### Prospects' Integration Concerns

Key Concern	Rank
Security	1
Reliability	2
EDI Issues	3
Speed/Timeliness of Integration	3
Process	4

Source: INPUT

#### 1. Security

Security will probably always be an issue. The leading concern users had is security of information / security risks and reliability, primarily related to the Internet and Extranets. Most of these concerns were not related to EDI, because there was the belief that VANs, direct connections and private networks, and security mechanisms built into EDI transactions were adequate protection.

Concerns were related to:

- The need to protect information from being tampered with (which can be solved by encryption)
- The need to prove that customers and merchants are who they say they are (which can be solved by authentication technologies).
- The need to ensure that each participant can do what it is that they want to do (which can be solved by authorization).

- Many organizations were concerned about competitors gaining access to critical information. This was a major issue with manufacturers. They were fearful that their distributors (whom also handle other products) would divulge information to their competitors.
- Other organizations were concerned about fraud. While it has been reported that companies should expect to lose \$1 per \$1,000 of transactions due to electronic commerce fraud – this is significantly less than telephone fraud (\$16 / \$1,000) or cellular phone fraud (\$19.83 / \$1,000).
- Additional concerns were expressed regarding sales force automation software enabling changes to be made to key data that may, for example, lower prices.

Users need to verify whether the concerns are real, and vendors need to help users address this concern, much of which might be irrational due to media hype. Today there exists a vast array of internet and EDI security methods – firewalls, intrusion detectors, digital certificates, access control, virtual private networks, software-based protocols and encryption technologies – that are in place to virtually guarantee protection in this area.

Users also need to understand the impact of taking security measures on their business. For example, if they provide too much security they could slow down the processing of online activity.

In general, in the business-to-business EC environment, security is less of a problem than business-to-consumer. In business-to-business commerce, users know whom they are dealing with. They usually have a small number of “partners” and fewer transactions. When working with suppliers, distributors and other business partners, they can usually make assumptions about their partners technology base, connectivity, and response time. On the other hand, in business-to-consumer you don’t know who or what you are dealing with.

## **2. EDI**

EDI Issues and Speed/Timeliness of Integration were tied as the next major areas of concern. There exists a lot of confusion and fear over EDI.

Some of the confusion was related to misconceptions and lack of understanding related to EDI, and there still exists a lack of awareness that most of the service providers offer programs designed to assist companies with communicating with non-EDI trading partners. There was also confusion over what is EDI, EDI translators as an integration technology, and EDI vendors as value-added network service providers.

“The perimeters for EDI are so broad, and sending and receiving is too complicated. Our customers are not demanding it, and we prefer not to do it.”

(\$1B Retail Distributor)

“Most of our suppliers are not up on EDI – they don’t understand it. We need more suppliers to get up on this area.”

(\$10B Process Manufacturer)

There was confusion related to EDI vs. the Internet for electronic commerce. For example - while the Internet makes sense for many businesses, it has not eliminated the need for EDI.

### **3. Speed / Timeliness**

In the area of speed/timeliness, the concerns were primarily related to the process of implementation. This might be due to the reality that many of the existing enterprise applications could not support interactive EC because they are comprised of a variety of incompatible hardware, software and data descriptions. Because they were intended to link application systems across enterprise boundaries, many existing infrastructures were designed to support only certain EDI batch exchanges and data translations. Such enterprise applications cannot be used as a foundation for an EC infrastructure that must link web-based EC and traditional transaction processing systems. Thus, the greatest fear is that of replicating the length of time re-engineering / implementation of enterprise systems has been known to take.

- It is well known among everyone in the industry, and especially users in very large organizations, that enterprise-wide application systems typically take greater than 24 months to implement, and generally take a longer than expected time to implement.
- In fact, SAP has been struggling to address this issue, which was identified by one of their competitors in an advertising campaign. The ad headline read: “Imagine a headache that could last for more than two years.” And the copy read: “Re-engineering your organization has become like a dull thud in the back of your skull. After two years, the business software system is still in implementation phase. The costs are mounting up. And there’s no end in sight.”



#### **4. Process**

There was valid concern that the network, systems and applications management challenges of electronic commerce would be radically different than those of either client/server or the mainframe.

#### **5. Summary**

All of these concerns appear to be examples of having fear of the unknown, as none of the companies that had completed the integration exercise mentioned these as issues or areas in which they should have acted differently.

However, these concerns should not be dismissed. Instead, they must be incorporated into the planning process, and potential vendors should be asked to explain how their solutions overcome these concerns.

## H

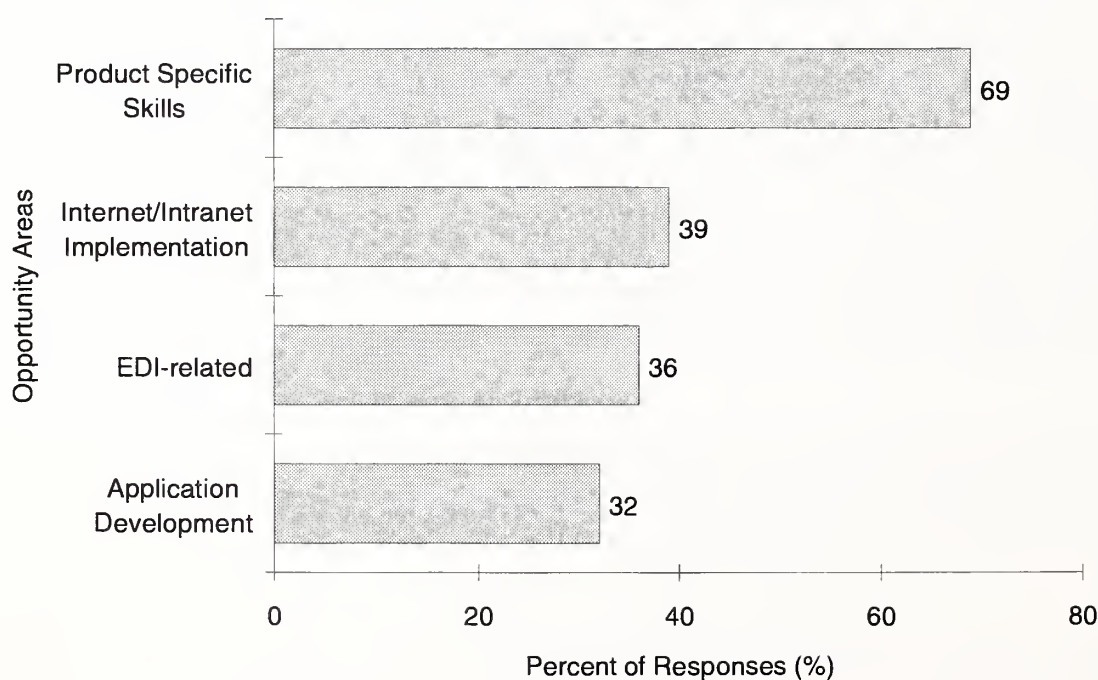
## Areas Where Users Want Assistance

For the most part users felt very confident in their in-house resources, in particular in the area of application development, and weak in product knowledge and Internet/Intranet implementation. However, virtually all users stated that they would not go it alone – that they would use a vendor, either exclusively, or in combination with in-house resources. This might not be due to desire, but due to the severe IT staffing issue that everyone is facing.

They identified some very clear opportunities for vendor assistance, as shown in Exhibit III-12.

Exhibit III-12

### Opportunities for Vendors to Assist Users



Source: INPUT

Sixty-nine percent of the users said that they would involve a vendor for “Product Specific” integration requirements. This is probably due to the fact that for the most part users did not have third party product experts in-house; if they did, they were usually for only one application module.

The need for vendor assistance with Internet/Intranet implementation (39%) and EDI-related activities (36%) did not come as a surprise given:

- the fears and concerns that the users had expressed in this area,
- the fact that EDI is not going away, and
- the expectation that EDI will be tied more heavily to the Internet in the future.

These are areas of key opportunity for vendors.

## Costs of EC/EAS Integration

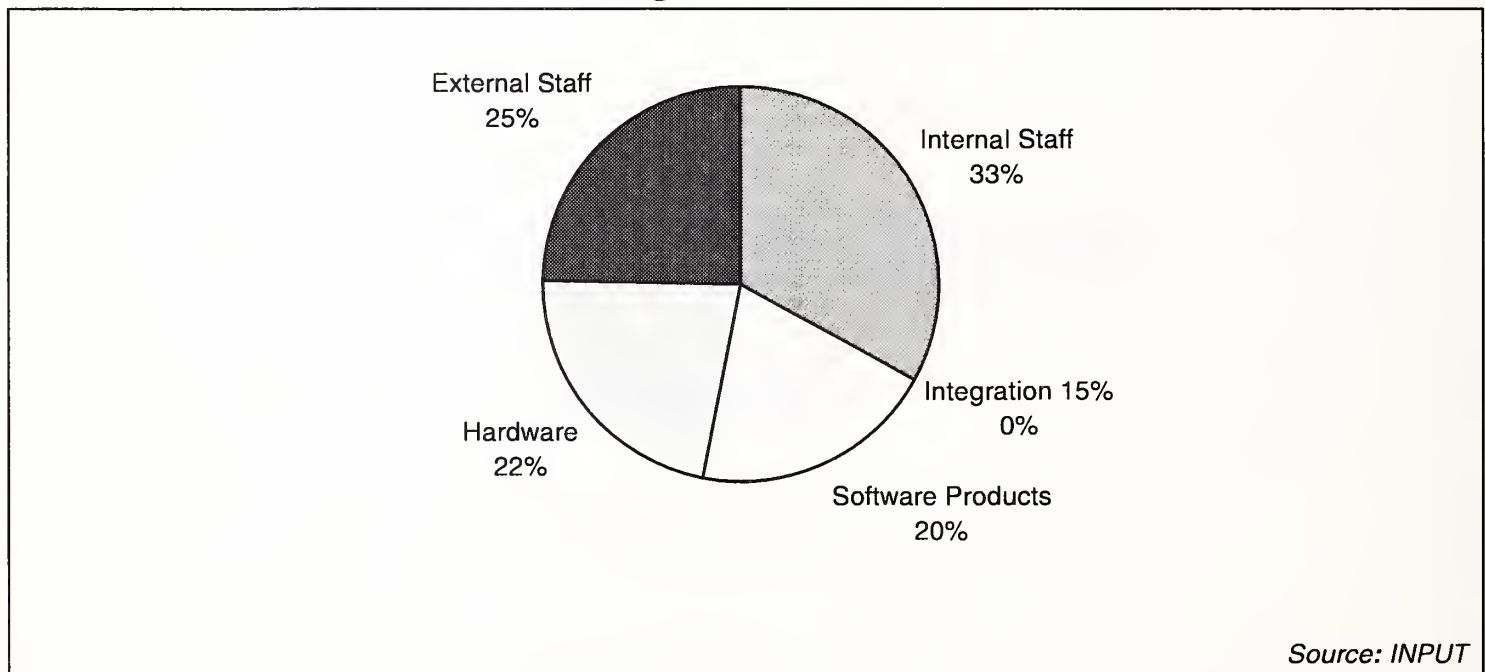
### 1. Relative Proportion of Spending on Requirements for EC/EAS Integration

How are budgets being allocated for?

Exhibit III-13 shows the breakdown of budget allocations for staffing, products and integration.

Exhibit III-13

**Budget Allocations**



A significant portion of the budgets (almost  $\frac{3}{4}$ ) has been allocated for both products and external services.

- 36% of the budget allocation is dedicated to consulting, design, implementation or integration management by an external solutions provider/vendor.
- Another 36% of the budgets are allocated to the purchase of software and hardware products.



The expectation users have is that these percentages will continue to increase, and that the allocation for internal resources might become lower given the fact that it is becoming more and more difficult to hire and keep good internal IT staff.

## **2. Expenditures**

Integration was not cheap. 27% of the users interviewed spent more than \$1M, and many said that it would be a continuous project - an ongoing sinkhole.

“Integration was “completed” but we are constantly upgrading”  
(\$1.5B Process Manufacturer)

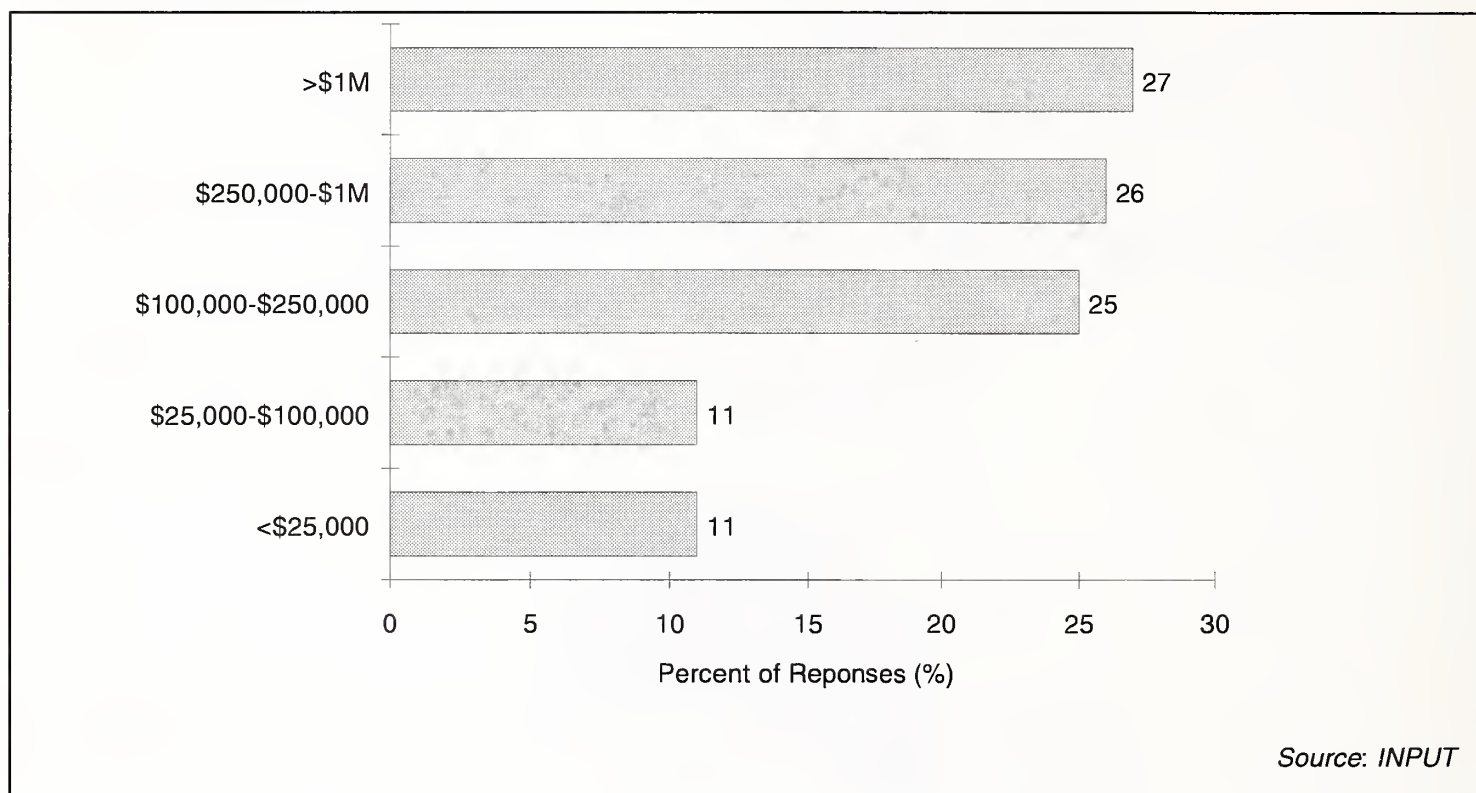
“We are constantly integrating all functional areas such as sales.”  
(\$10B Process Manufacturer)

“We are always looking to integrate further.”  
(\$1.1B Discrete Manufacturer)

Integrating these applications ranged from under \$100K for the initial integration of one or two types of EC transactions, to several hundred million dollars for \$1B+ size organizations.

Exhibit III-14 shows the range of expenditure amongst the users.

Exhibit III-14

**Total Expenditures on Integration of EC and EAS**

## J

### Leading Products and Services Vendors

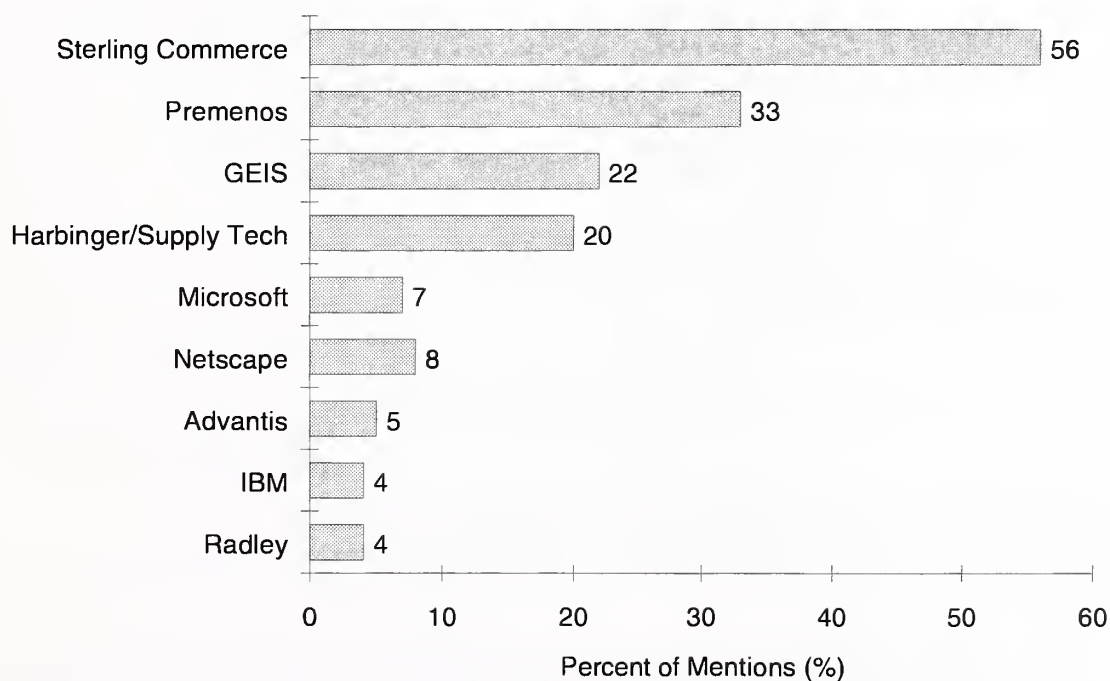
#### 1. Leading EC Software Vendors

When asked who they believed to be the top three leading vendors of EC software, Sterling Commerce was mentioned by more than half of the users, followed by Premenos (33%), now owned by Harbinger, and GEIS (22%), with Harbinger (20%) also a clear leader following close behind.

Exhibit III-15 shows the vendors that were perceived by the users to be the leaders in EC software.

Exhibit III-15

#### Most Often Mentioned Electronic Commerce Vendors



Source: INPUT

The users perceived Sterling Commerce (, Premenos, GEIS, and Harbinger, all major EC Software vendors, to be the leaders.

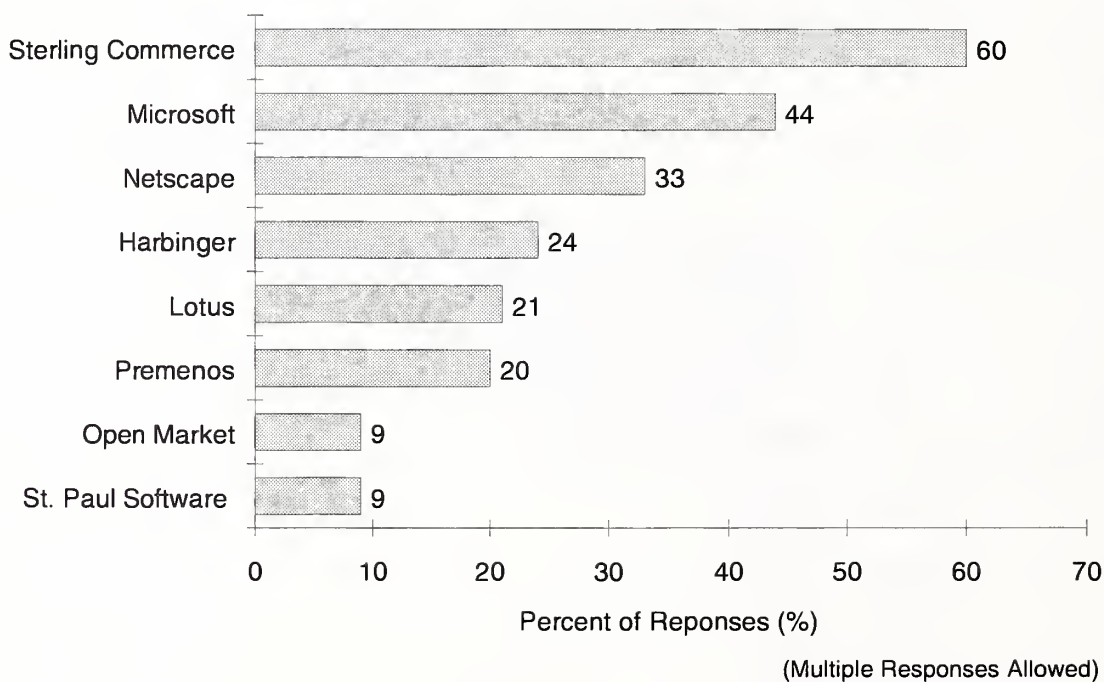
## 2. Vendors to Be Used

When asked which “technology vendors” they anticipated using over the next three years for “electronic commerce” applications, U.S. users named Sterling Commerce, Microsoft, Netscape, Harbinger, Lotus and Premenos the most often.

Exhibit III-16 shows the percentage of responses vendors received.

Exhibit III-16

### “Technology Vendors” To Be Used Within 3 Years (U.S.)



Source: INPUT

As can be seen, the vendors run the gamut of big players and startups. They include EDI/EC software players and value added networks, commerce platform component vendors, electronic-commerce engines, and server vendors, which reflects part of the problem in this area – there is confusion amongst users as to which vendor to call in for what and when.

However, the good news is that there is opportunity for everyone. The constantly changing technology will drive users into the arms of a plethora of vendors.

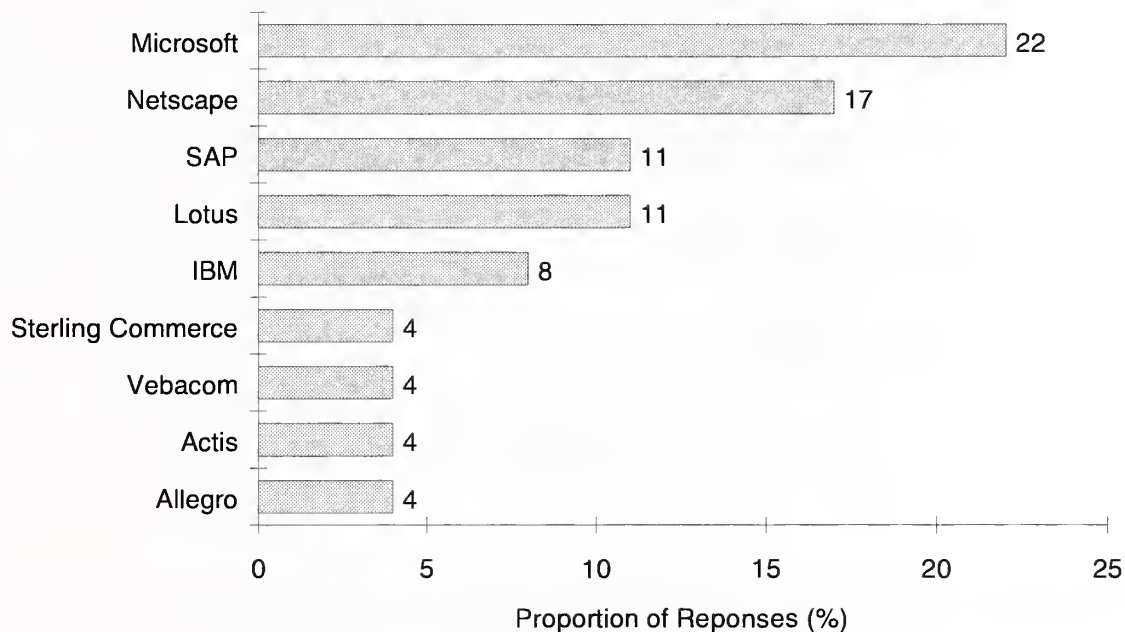


### 3. Technology Vendors in Europe

Exhibit III-17 shows the percentage of responses users in Europe gave vendors.

Exhibit III-17

#### “Technology Vendors” To Be Used Within 3 Years (Europe)



Source: INPUT

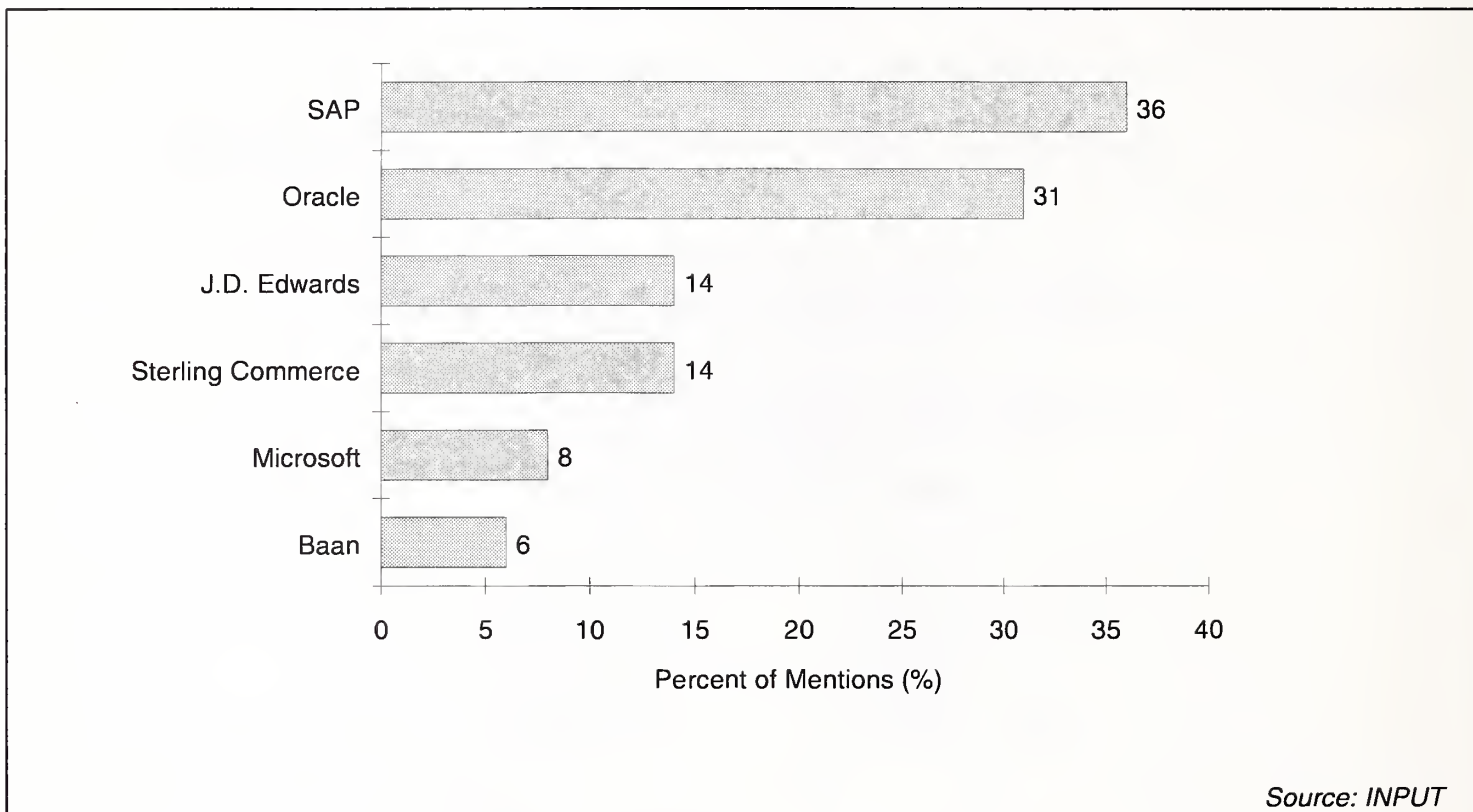
For these users it seems that the major players, those that are offering a broad array of electronic commerce capabilities i.e. Microsoft and Netscape, are the clear winners.

### 4. Leading EAS Software Vendors

The users were also asked to name who they perceived to be the leading vendors of EAS software, and whom they would use.

This is shown in Exhibit III-18.

Exhibit III-18

**User Perception of Leading EAS Vendors**

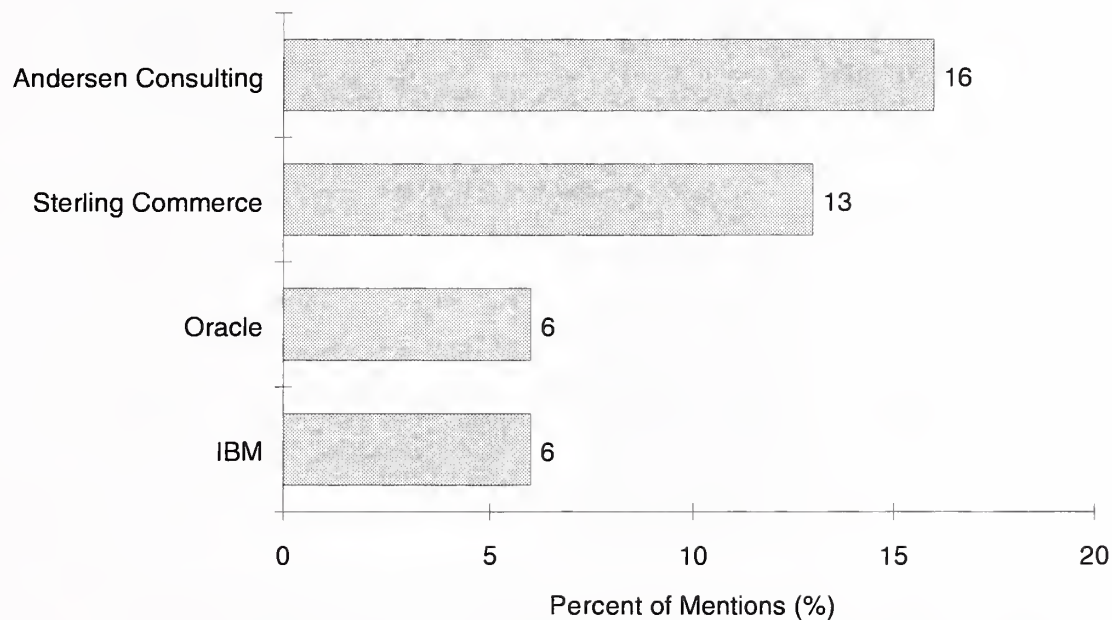
Users ranked SAP and Oracle as the clear leaders. What is interesting is that they included Sterling Commerce and Microsoft, neither of whom the marketplace or industry analysts would put in the category of being a “traditional” EAS vendor.

**5. Leading Integration Vendors**

When asked who they believed to be the three leading vendors for integrating electronic commerce and enterprise applications, they turned to the Big Six as Number 1. Andersen Consulting received the greatest number of mentions, followed by Sterling Commerce, IBM and Oracle.

Exhibit III-19 shows how the users ranked the vendors.

Exhibit III-19

**Leading Integration Vendors***Source: INPUT*

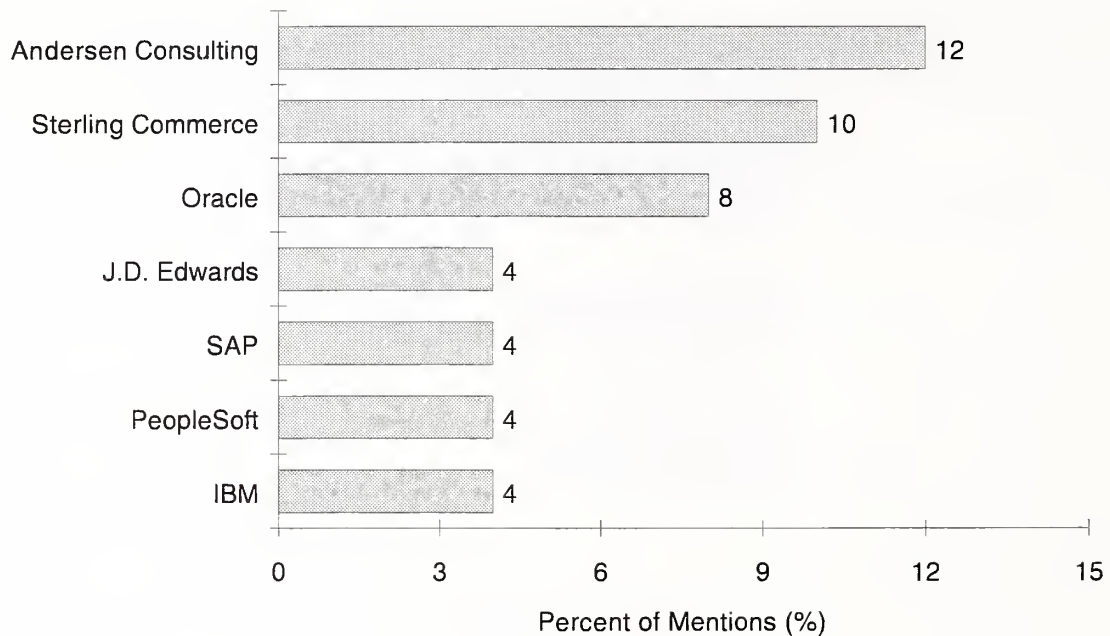
Andersen Consulting was cited for overall systems integration, as well as their ability to provide vertical applications and specific industry knowledge, with Sterling Commerce following close behind.

Andersen Consulting and IBM were both seen as offering "soup to nuts" capabilities.

**6. Vendors to Assist with Required Skills**

When users were asked to identify possible vendors to assist with "Required Skills" integration, Andersen Consulting was again mentioned the most often, as shown in Exhibit III-20.

Exhibit III-20

**Vendors to Assist with "Required Skills" for Integration***Source: INPUT*

When asked about possible vendors to assist with specific areas of "Required Skills", SAP was mentioned the most often.

Exhibit III-21 shows how the vendors fared in specific areas.



Exhibit III-21

**Vendors to Assist with Specific “Required Skills”**

<b>Required Skill</b>	<b>Vendor 1</b>	<b>Vendor 2</b>	<b>Vendor 3</b>
Application Development	Oracle	J.D. Edwards	SAP
Change Management	None	None	None
Human Resources	PeopleSoft		
Internet/Intranet	Sterling	SAP	Microsoft
EDI	Sterling	SAP	

*Source: INPUT*

Sterling Commerce, Microsoft and SAP were mentioned the most as the vendors that they would use specifically for Internet and EDI integration.

Oracle, J.D. Edwards and SAP were cited as the vendors of choice for specific application development and extension.

It is interesting to note that no vendor was mentioned for Change Management. A number of vendors offer this as a separate service and others as part of their implementation process (i.e. Masterpack International). Since there does not appear to be a clear leading vendor that jumps to mind, this seems to be a great opportunity for vendors to be aggressive in their sales and marketing efforts.

**7. Vendor Awareness / Reputation**

Exhibit III-22 provides an overview of how vendors overall ranked in awareness among users.

Exhibit III-22

**Vendor Awareness / Reputation Among Users**

<b>Vendor</b>	<b>EC Software Products</b>	<b>Enterprise Application Software</b>	<b>Integration Services</b>
<b>Sterling Commerce</b>	<b>56</b>	14	10
<b>SAP</b>	-	<b>36</b>	4
<b>Oracle</b>	-	31	8
<b>Premenos</b>	33	-	-
<b>GEIS</b>	22	-	-
<b>Harbinger/Supply Tech</b>	20	-	-
<b>J.D.Edwards</b>	-	14	4
<b>Microsoft</b>	7	8	-
<b>Andersen Consulting</b>	-	-	<b>12</b>
Netscape	8	-	-
IBM	4	-	4
Baan	-	8	-
Advantis	5	-	-
PeopleSoft	-	-	4
Radley	4	-	-

*Source: INPUT*

From these responses it appears that Sterling Commerce is the leader in EC Software vendor awareness, followed by Premenos, GEIS and Harbinger. SAP is perceived to be the leader in EAS Software vendor awareness, followed by Oracle. Andersen Consulting is considered the leader in Integration Services vendor awareness, followed close behind by Sterling Commerce, and then Oracle.

Sterling Commerce has the greatest overall “awareness” among the users in all three areas – EC Software, EAS Software, and Integration Services, although Sterling Commerce is not known in the marketplace as an “EAS” vendor.

SAP, Oracle and J.D. Edwards, the big three largest EAS vendors, are seen as the leaders in providing both EAS and integration services.

## K

## Direction of Electronic Commerce and Enterprise Application Integration

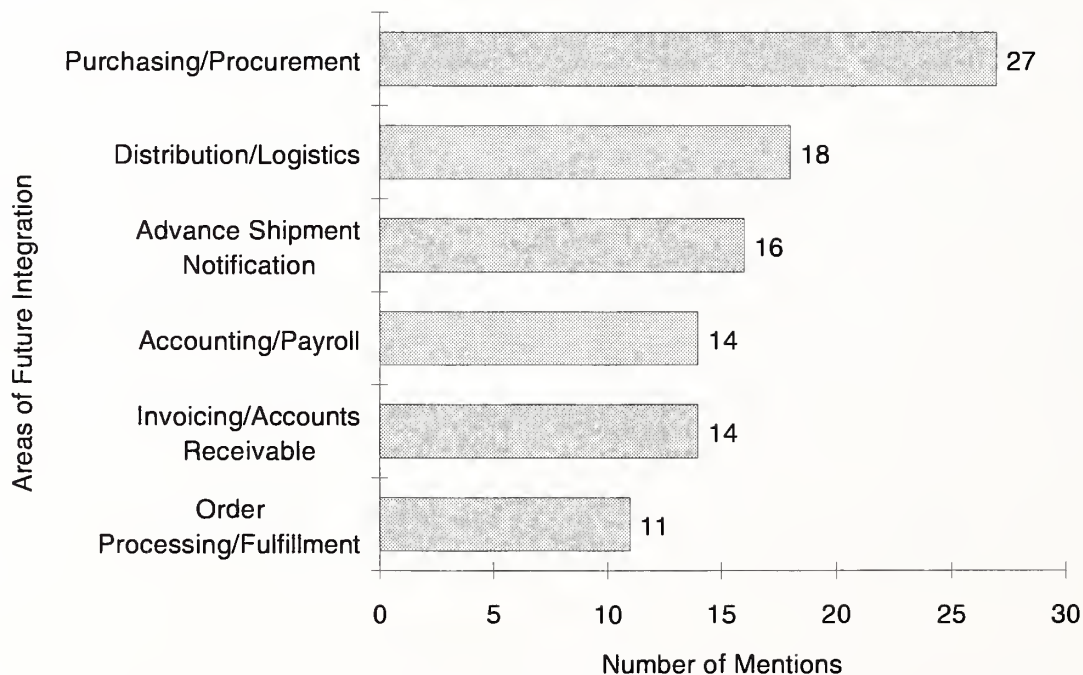
### 1. User Plans for Additional Integration

Virtually everyone, both existing users and those planning integration, expect this to be an ongoing process.

Exhibit III-23 shows the areas of future application integration.

Exhibit III-23

#### User Plans for Additional Integration



Source: INPUT

Purchasing/procurement was identified as the most important area for future integration. Users also mentioned the ongoing and continual process / direction of moving more EDI transactions to the web – Internet EDI.

### 2. Vendors to be Used

Those planning integration were asked to identify who they were planning to use as a “technology” vendor, and Microsoft was identified as the leader by over 56% of the users, with Open Market (38%) and Netscape (33%) following behind.



**L****User Advice****1. Lessons Learned by Users**

Users were asked about advice that they would give to vendors and to users that are still in the planning stages of integration.

Exhibit III-24 lists those lessons learned.

Exhibit III-24

**Lessons Learned by Users**

- Improve up-front planning
- Simplify
- Standardize
- Start sooner
- Accelerate project completion
- Improve enterprise-wide communications about project
- Get more training
- Get more flexible and user-friendly software
- Depend less on in-house resources
- Seek complete solutions

*Source: INPUT*

While each of the lessons listed above were mentioned several times, the overwhelming number one lesson learned was better planning and time spent upfront:

“Form a committee rather than put it on one person. And all functional areas should be represented.”  
(\$1.4B Wholesale Distributor)

“We should have spent more time planning, and we should have talked to more people first”  
(\$600M Transportation Company)

“Spend a lot more time investigating the setup. We were too rushed to take the time to thoroughly plan this.”  
(\$1B Wholesale Supplier)

## 2. Advice to Vendors

The topic that was voiced the most frequently was in the area of vendor knowledge.

Exhibit III-25 highlights the recommendations the users had for vendors.

Exhibit III-25

### User Recommendations for Vendors

- Salespeople/vendors should be more technical; know product better
- Need better understanding of importance of EC and results it can achieve
- Provide more and better training
- Offer more complete solutions
- Make documentation easier to understand
- Provide more support/continuous helpline
- Develop more flexible applications
- Create more robust products
- EDI capabilities
- More standardization
- Be more results-oriented; base development on customer requirements

Source: INPUT

All of above got multiple mentions, but there was a general sense that vendors are not up to speed on EC, and that vendor sales people do not have the knowledge to sell the products and services that they are being asked to. The following are some of the sentiments shared by the users in respect to this:

“Make sure there is an appreciation for what integration of electronic commerce can do. Vendors need a better understanding of how important this is to their customers.”  
(\$783MM Process Manufacturer)

“Vendors need a better understand of electronic commerce.”  
(\$7.5M Process Manufacturer)

“Vendors need to be more technical and specific, not just giving sales pitches in general terms.”  
(\$70B Discrete Manufacturer)

“Keep it simple. Vendors need competent sales and implementation people. Vendors need to be prepared to provide support.”  
(\$32B Discrete Manufacturer)

“Sales people who know the product!”  
(\$809M Wholesale Distributor)

“Know the area you are working in, and offer a complete solution.”  
(\$5.5B Process Manufacturer)

Users also recommended that vendors pay more attention to them and value them more as customers:

“Listen to us, the customer. Deliver what we, the customer, asks for.”  
(\$6.3B Utility Company)

“Acquire us, the customer, and then don't forget about us – keep us up-to-date and help us know how to stay on top of the latest technologies.”  
(\$6M Transportation Company)

Additionally, users felt the need for better support:

“Always have a help line available.”  
(\$150M Discrete Manufacturer)

“Customer support needs to be strong! We need the availability of help.”  
(\$995MM Utility Company)

Users felt that vendors needed to understand that it was not only an IT decision and that the project went more smoothly if there was a team involved:

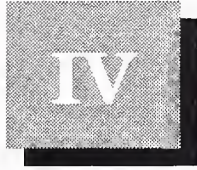
“We found that if the business people lead in each area along with IT, it works best.”  
(\$1B Discrete Manufacturer)

In addition to the areas that received multiple mentions, the following recommendations were raised:

- More consistency
- More customization; listen better to customer needs
- Integration with legacy systems
- Better marketing materials to stand out from the others
- Continuous communications with customer and other vendors involved







## User Perspectives by Industry

Technology, Electronic Commerce and the Internet have redefined the playing field throughout the supply chain. Suppliers are expecting collaboration and non-traditional relationships. Customers that were once “locked in”, are now re-examining relationships, and are demanding a level of one-to-one marketing, direct links, collaboration, and “customer care.

The rules for entry and staying in the game have changed, and users in all industries have recognized it.

The Manufacturing / Distribution and Retail Trade Industries have been early adopters of Electronic Commerce transactions. INPUT interviewed users in these industries in more detail, and their perspectives are represented in this section.

**A****Manufacturing / Distribution Industry**

Manufacturers and Distributors are looking to Electronic Commerce integration with their EAS/ERP systems to facilitate better communication with their customers' and suppliers' systems. Manufacturers want to improve bottom line benefits by shortening manufacturing cycles and improving supply chain management. Distributors want more information, faster. Both want to be able to differentiate themselves from their competitors.

"The company that gets to market fastest (has the fastest cycles) gets the business."

(Distribution Company)

"We want our supply chains to supply real-time information and just-in-time delivery."

(\$5.5B Process Manufacturer)

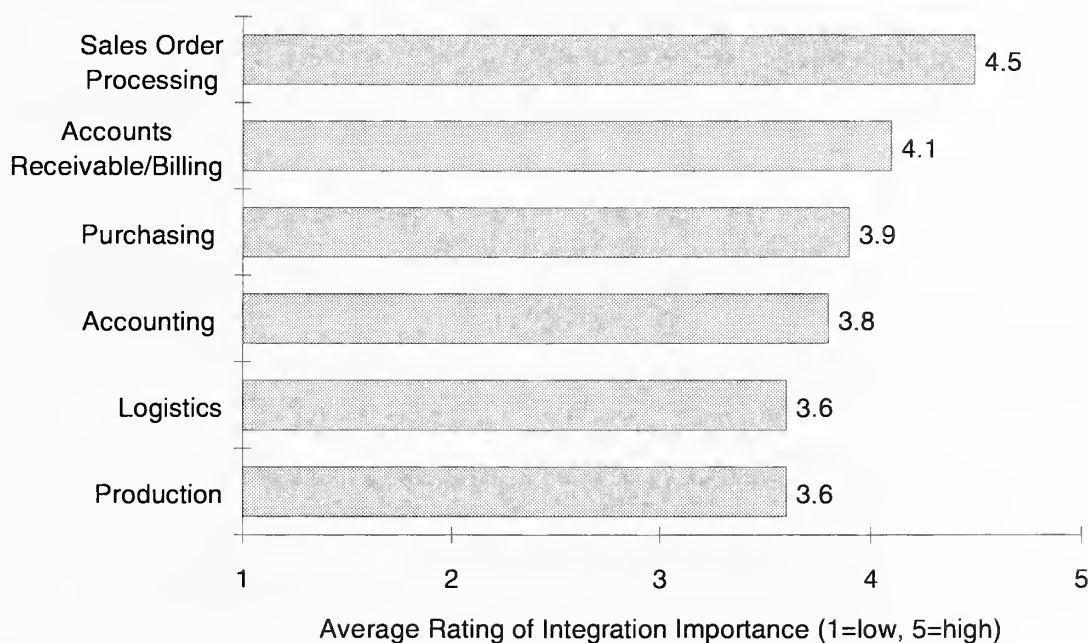
Manufacturers and Distributors are getting online in a big way. For the most part their web sites today are devoted to improving customer service, but they are looking toward EDI and the Internet as having a major impact on "extending the enterprise" and linking their supply chain.

**1. Business Functions and Processes Impacted by EC**

In direct response to the changing rules of the game, one of the areas most impacted by Electronic Commerce has been "Sales Order Processing."

Exhibit IV-1 shows the importance users in Manufacturing and Distribution attributed to specific areas of EC and EAS integration.

Exhibit IV-1

**Functional Areas Involved in EC and EAS Integration**

Source: INPUT

It was not a surprise to find that for Discrete and Process Manufacturing Industries, “Sales Order Processing” and “Accounts Receivable/Billing” were the most important areas for integration with electronic commerce. Even though the nature of the manufacturing process for both groups is different, what is important to them is generating revenue (selling), and then getting paid as quickly as possible.

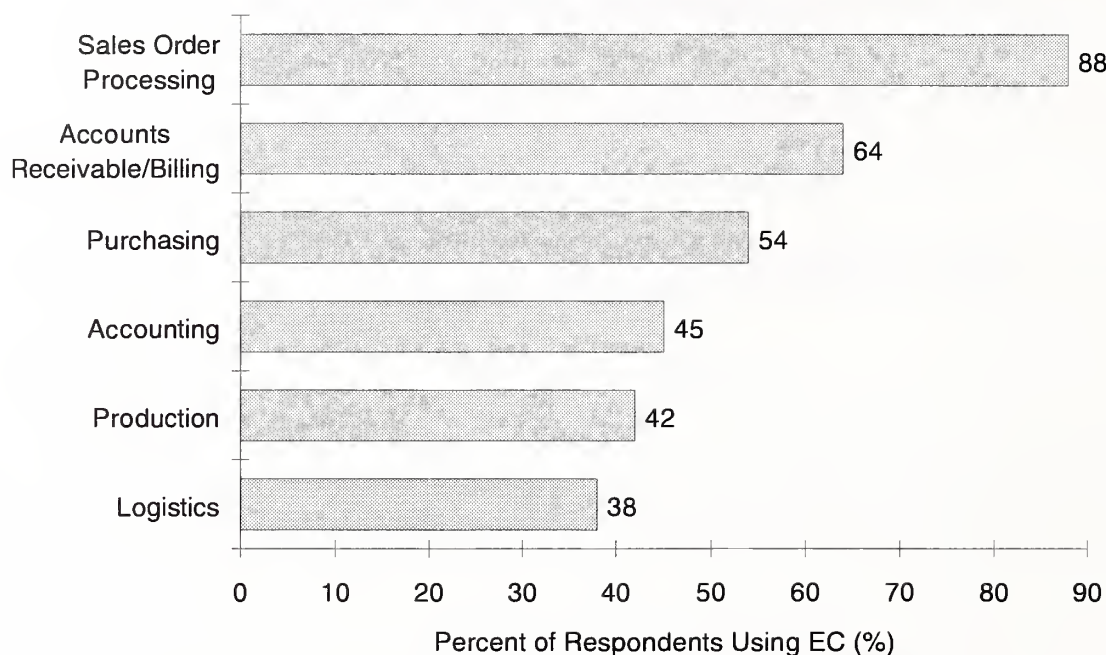
The integration of the “Purchasing” function with Electronic Commerce was more important to Discrete Manufacturers, who gave it a rating of 4.4, than Process Manufacturers. Users want to let their purchasing professionals and engineers order parts directly from suppliers online catalogs. This is only logical, since for the most part Discrete Manufacturers do not need a part until they get an order, and then they need to get that part in a hurry. In Process Manufacturing, purchasing is almost irrelevant; orders are more or less open and ongoing, with inventory virtually always flowing in. The goal for users here is to “almost do away with purchasing” and for suppliers to actually be able to look at inventory levels and automatically replenish stock based on that information.

## 2. Penetration of Electronic Commerce in Business Functions

Exhibit IV-2 shows the areas of their business where Electronic Commerce is already integrated with business functions.

Exhibit IV-2

### Portion of Business Conducted via Electronic Commerce Manufacturing/Distribution Industry



Source: INPUT

As the chart shows, this closely follows the areas that were seen to be most important to be integrated. Over 88% of the respondents have already integrated Electronic Commerce with "Sales Order Processing", followed by the "cash flow" impacted business function of "Accounts/Receivable Billing" at 64% and "Purchasing" at 54%.

There were some differences between Discrete Manufacturing and Process Manufacturing segments, again, based on the nature of their manufacturing process.

- In two areas, Discrete Manufacturing had higher percentages than Process Manufacturing:
  - A higher percentage of Discrete Manufacturers (42%) are using electronic commerce in Logistics versus Process Manufacturers (36%).



- A much higher percentage of Discrete Manufacturers (64%) are using electronic commerce transactions in Purchasing versus Process Manufacturers (45%).
- And in two areas, Process Manufacturing had higher percentages than Discrete Manufacturing:
  - A much higher percentage of Process Manufacturers (52%) are using electronic commerce in Production related functions versus Discrete Manufacturers (29%).
  - A higher percentage of Process Manufacturers (93%) are using electronic commerce transactions in Sales Order Processing versus Discrete Manufacturers (81%).

### **3. Integration Objectives**

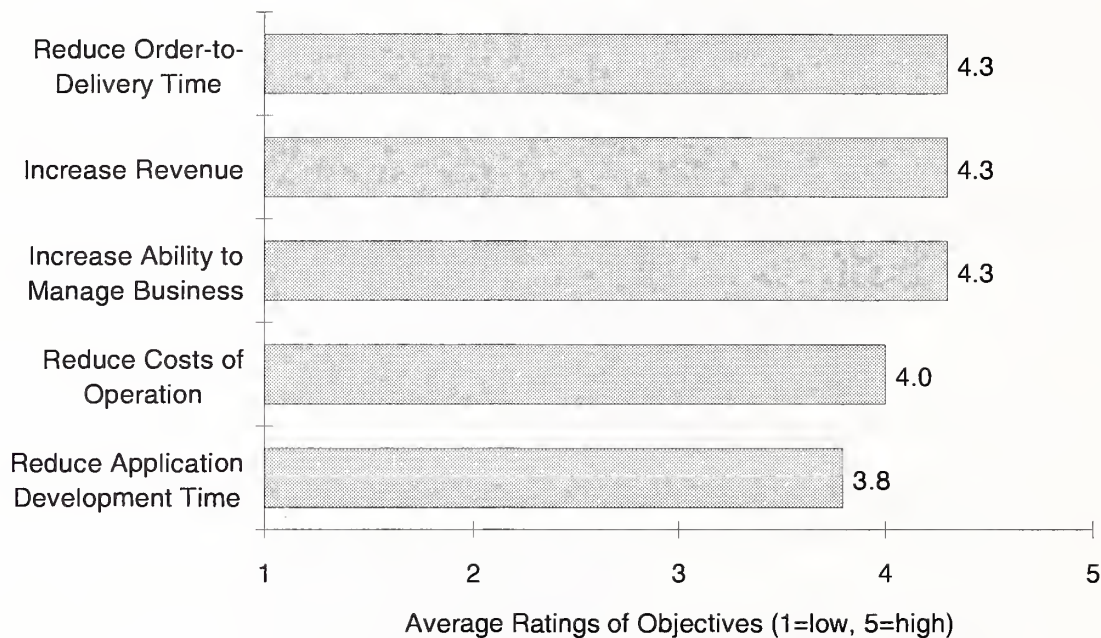
In general we found that Manufacturing and Distribution users had different objectives than the rest of the users interviewed.

For Manufacturing and Distribution users, winning new business, retaining existing relationships, and managing the business seem to be most important. This differed from the overall user population, ranked "Reduction in Costs of Operation" and "Reduction in Order-to-Delivery Time" as the two most important objectives to be achieved.

Exhibit IV-3 shows how users in the Manufacturing and Distribution Industry ranked integration objectives.

Exhibit IV-3

### User Objectives from EC/EAS Integration Manufacturing/Distribution Industry



Source: INPUT

“Reducing Order-to-Delivery Time”, “Increasing Revenue”, and “Better Ability to Manage the Business” were all ranked equally as the most important.

Some differences between Discrete Manufacturers and Process Manufacturers were noted.

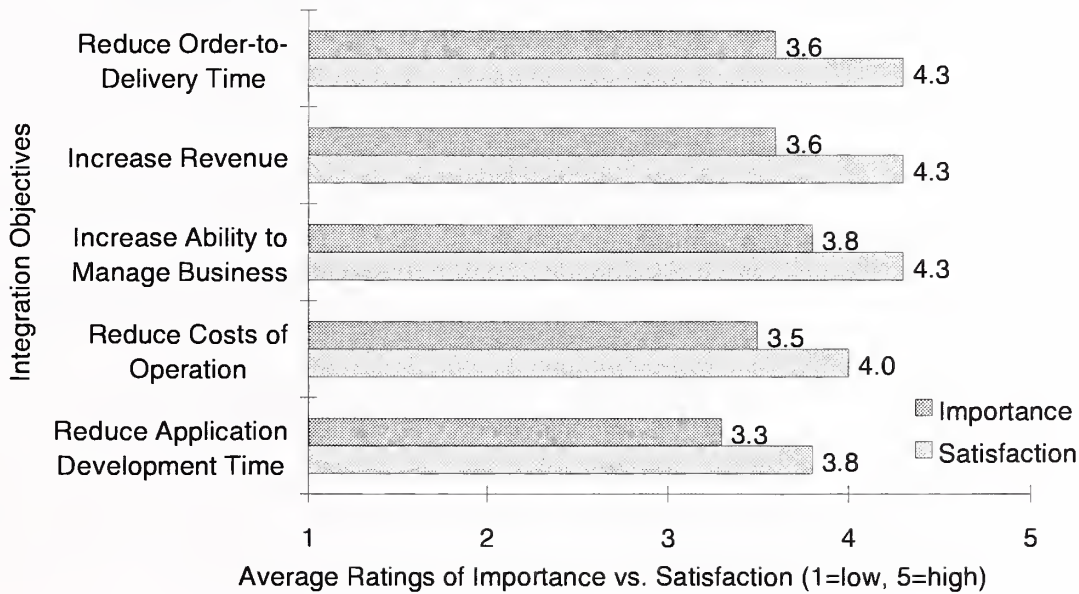
- Discrete Manufacturers attributed much more importance to “Increasing the Ability to Manage the Business” (4.8) versus Process Manufacturers (3.9).
- Discrete Manufacturers rated “Reducing costs” and “Reducing Order-to-Delivery Time” each at 4.4, versus Process Manufacturers, who rated these at 4.2 and 4.3 respectively.

#### 4. User Satisfaction with Integration

Exhibit IV-4 identifies the importance of expected benefits associated with integrating Electronic Commerce and Enterprise Applications, and the associated satisfaction with realizing these benefits.

Exhibit IV-4

#### Importance and Satisfaction with Integration Objectives Manufacturing/Distribution Industry



Source: INPUT

Two of the most important objectives for these users – “Reducing Order-to-Delivery Time” and “Increasing Revenue” fell significantly short of expectations, with a delta of .7.

The other most important objective, “Increasing Ability to Manage the Business” also fell short, with a delta of .6.

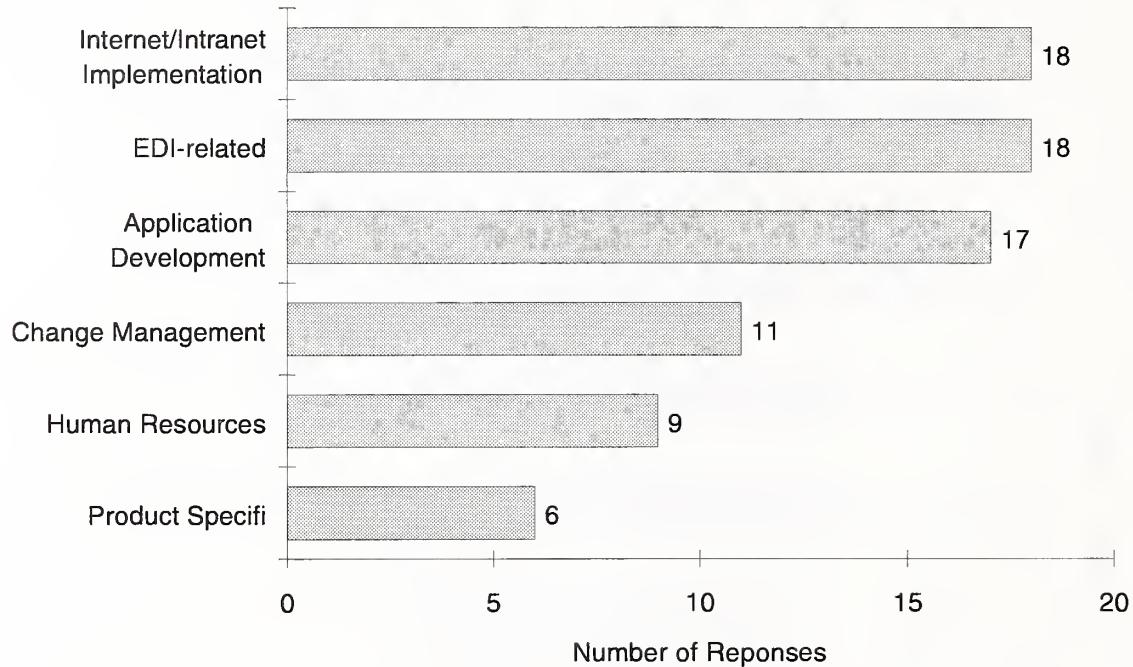
This leads when to think that vendors might need to do a better job of setting and managing expectations, as well as improving overall performance.

#### 5. Areas Where Users Need Assistance

Exhibit IV-5 identifies areas where users felt they needed additional services from external vendors.

Exhibit IV-5

**Unmet User EC/EAS Needs  
Manufacturing/Distribution Industry**



Source: INPUT

These users expect to use outside resources for "Internet" and "EDI" functions more than any other area. For this set of users, these two functions ranked higher than the user population overall, which ranked "Product Specific Skills" as the area where vendor assistance was most needed.

This is a clear opportunity where vendors need to be aggressive. The vendors mentioned most often by this group were Sterling Commerce, Harbinger and Premenos.

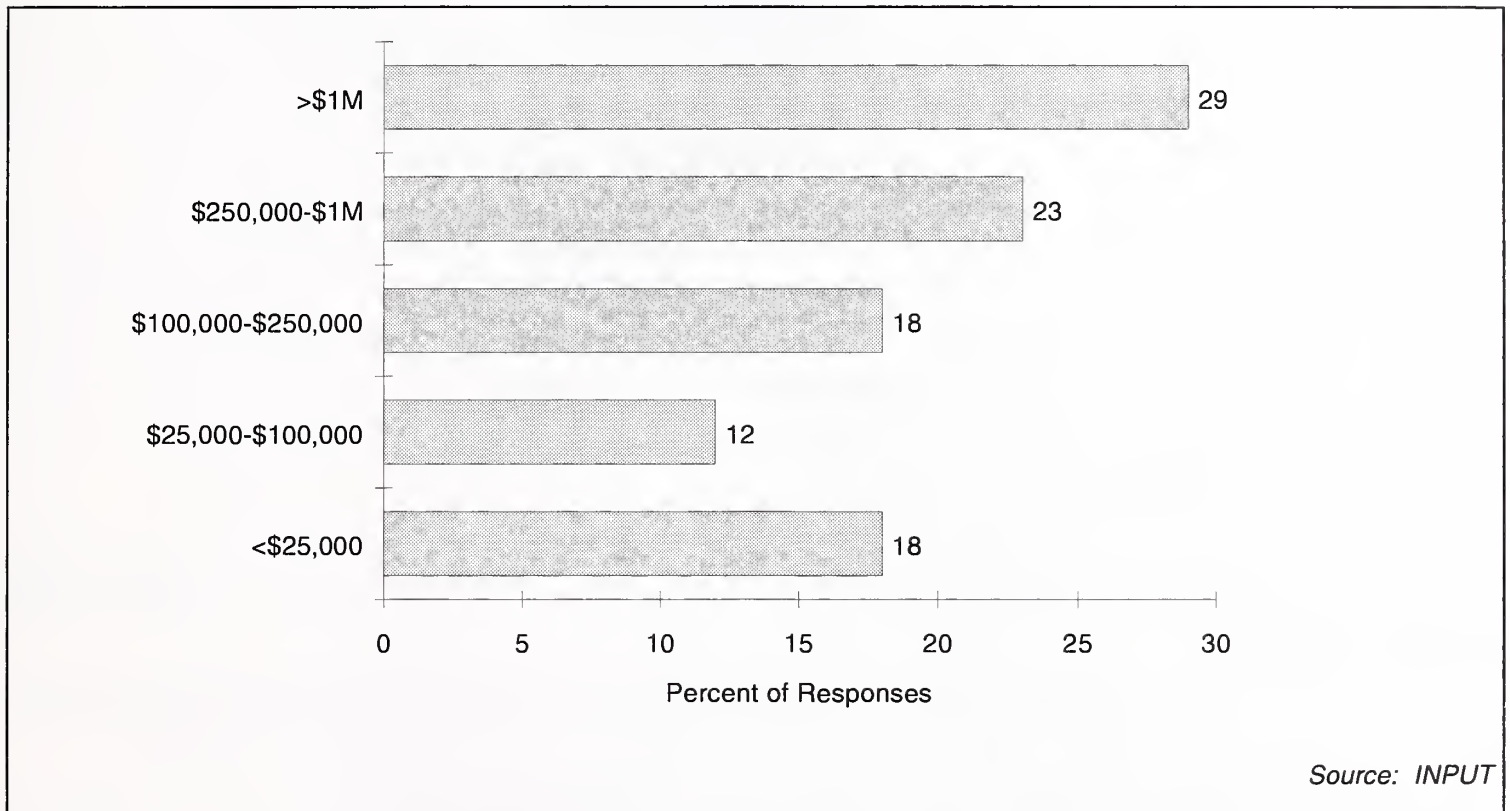


## 6. Costs of Integration

Exhibit IV-6 shows the range of expenditure amongst this group of users.

Exhibit IV-6

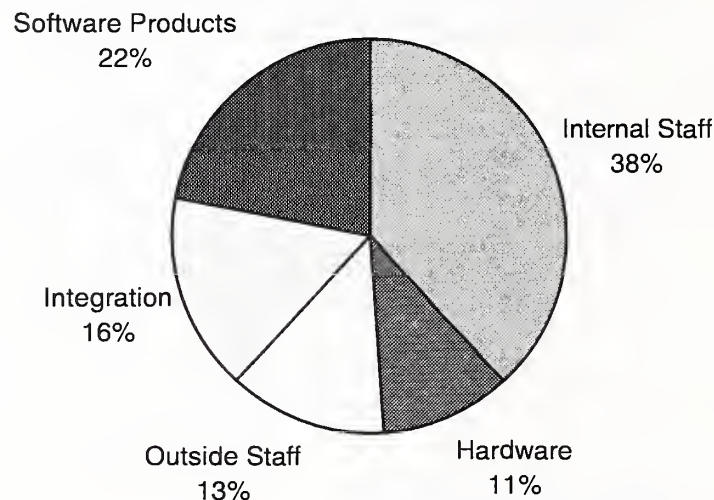
### Total Expenditures for EC/EAS Integration Manufacturing/Distribution Industry



Significant expenditure was planned for both products and external services, as can be seen in Exhibit IV-7.

Exhibit IV-7

### Budget Allocations for EC/EAS Integration Manufacturing/Distribution Industry



Source: INPUT

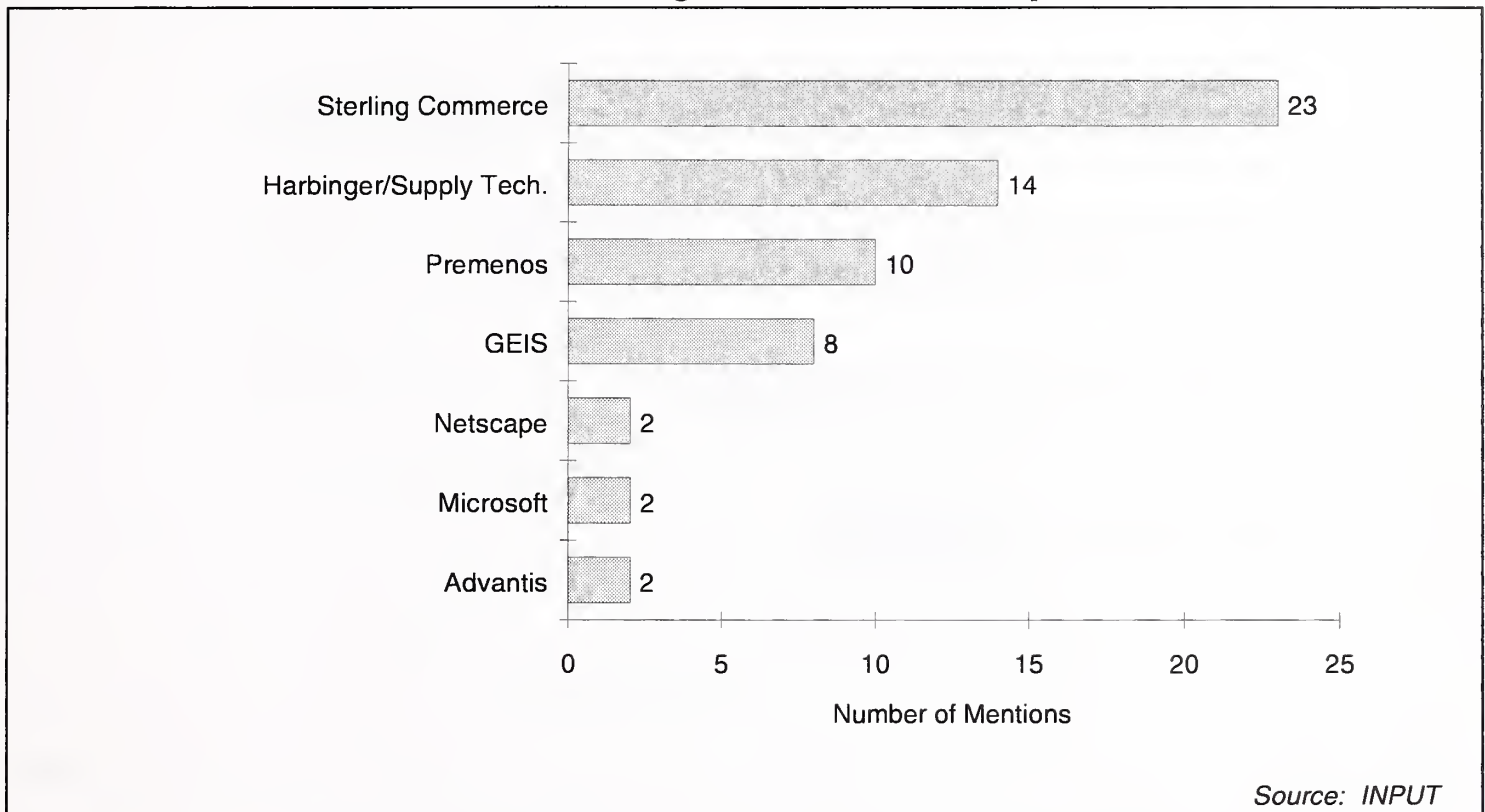
Like the population overall, this group expects to spend more than 50% of their budgets on external vendors, but the allocations are different.

- This group expects to use internal staff more, with a budget allocation of 38%, versus the overall population, which allocated 28% of their budget.
- They expect to spend less for external staff (13%) versus the overall population (21%).
- This group allocates more to software (22%) versus the overall population (17%).

#### 7. Leading Products and Services Vendors

When asked which of the following technology vendors they anticipated using over the next three years for "electronic commerce" applications, Sterling Commerce, Harbinger, Premenos and GEIS were mentioned the most often.

## Exhibit IV-8

**Most Often Mentioned Electronic Commerce Product Vendors  
Manufacturing/Distribution Industry**

What is interesting to see here is that the more traditional Electronic Commerce /EDI vendors (Sterling Commerce, Harbinger, Premenos, GEIS, Advantis) appear to be more top of mind to this audience than those vendors that are more associated with Internet Commerce, i.e. Microsoft and Netscape.

This might be due to the fact that this audience is very interested in EDI and EDI Software, as well as the Internet, and the “traditional vendors” are strong in EDI and are moving to Internet Commerce, whereas Microsoft and Netscape are not EDI vendors.

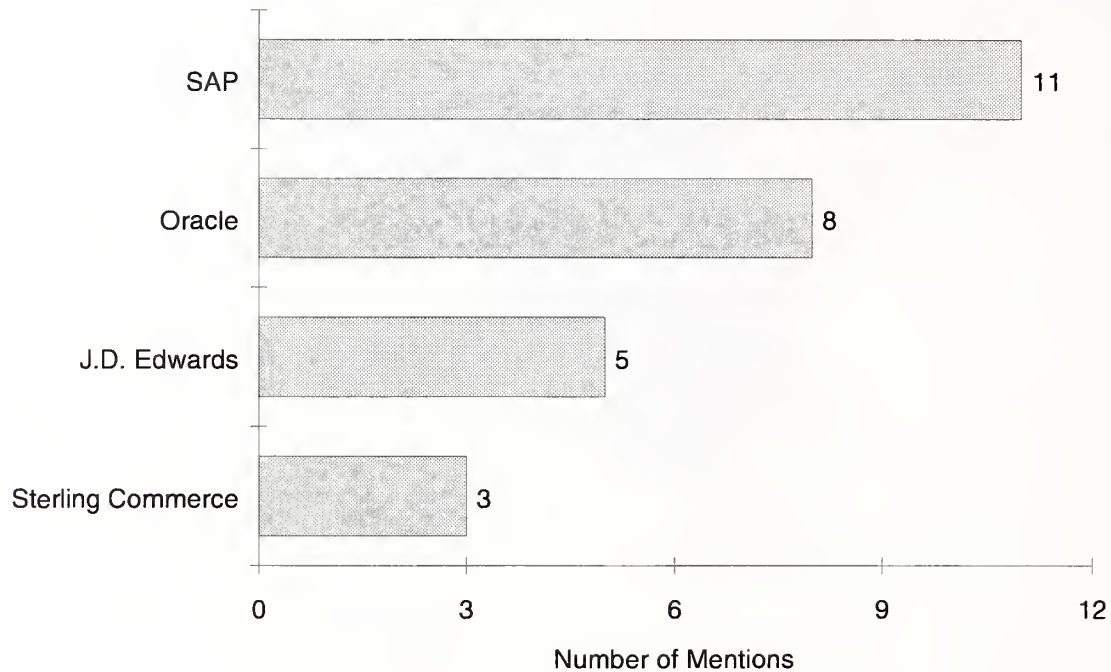
This is very different from the population overall, which included Netscape and Microsoft in the top 3, and did not have GEIS or Advantis mentioned.

Again, this identifies a clear opportunity for these vendors.

These users were also asked to name who they perceived to be the leading vendors of EAS software, and whom they would use. This is shown in Exhibit IV-9.

Exhibit IV-9

### Most Often Mentioned Enterprise Application Product Vendors Manufacturing/Distribution Industry



Source: INPUT

Consistent with the population overall, these users ranked SAP and Oracle as the clear leaders.

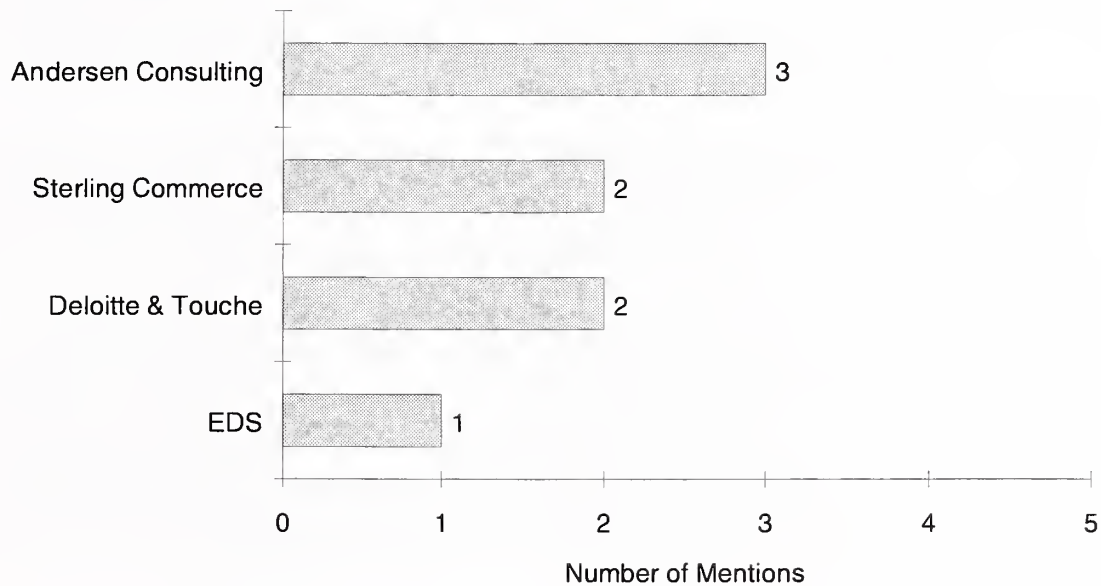
When asked who they believed to be the three leading vendors for integrating electronic commerce and enterprise applications, like the rest of the population, they ranked Andersen Consulting as Number 1.

Exhibit IV-10 shows how these users ranked the integration vendors.



Exhibit IV-10

**Most Often Mentioned Integration Service Vendors  
Manufacturing/Distribution Industry**



Source: INPUT

What is interesting here is that Deloitte & Touche and EDS did not have significant mentions in the overall population, but were ranked in the top three by this group.

**B****Retail/Wholesale Trade Industry**

The challenge for retailers has been to keep all players in the distribution chain (manufacturers, wholesalers, brokers, and distributors) efficiently linked so that the retailer can focus on keeping the customer base happy and growing.

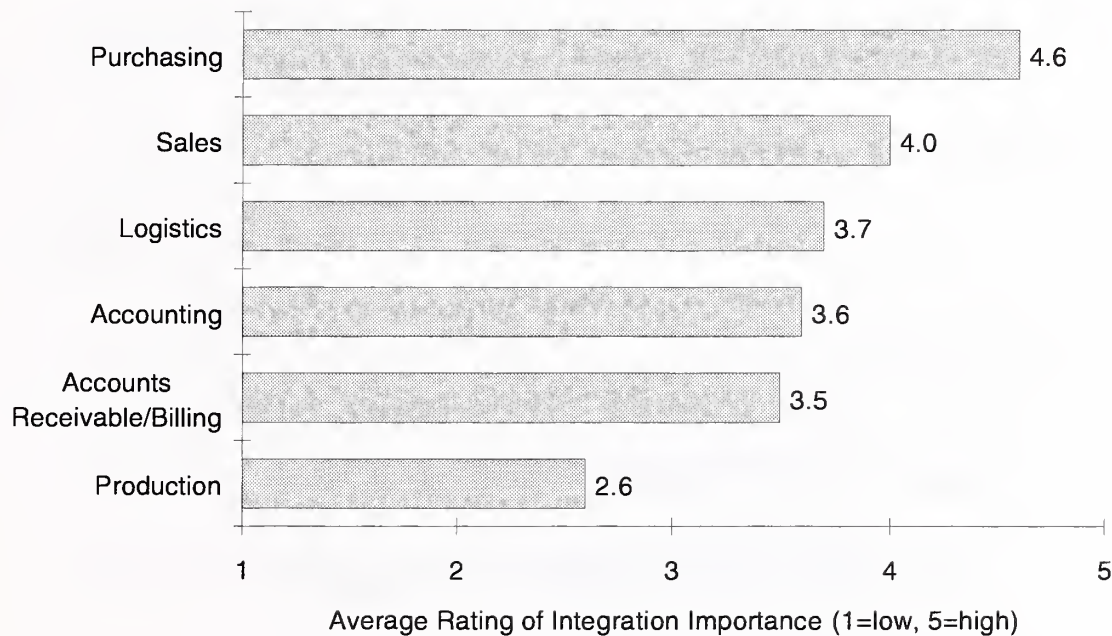
- For example, in retail food distribution this means things like Efficient Consumer Response (ECR) which is a strategy by which distributors, suppliers and brokers work together to bring greater value to the grocery consumer.
- In hardlines/hardware it might mean using EDI to reduce the elapsed time between the sale of the product and its replacement on the shelf.
- In mass merchandising it is implementing Quick Response (QR) to shave costs, reduce inventories, streamline operations and improve customer service.
- Other retailers are finding that Electronic Commerce, especially the Internet, has opened the floodgates to a growing global community of knowledgeable shoppers. It has also been seen as a great equalizer, allowing upstarts like Amazon.com to compete with established business.
- And in all areas the concern about interaction with payment and/or fulfillment systems.

**1. Business Functions and Processes Impacted by EC**

Exhibit IV-11 shows the importance users in retail distribution attributed to specific areas of EC and EAS integration.

Exhibit IV-11

### Functional Areas Involved in EC / EAS Integration Retail/Wholesale Trade Industry



Source: INPUT

These rankings are different than any other group. Users in retail distribution considered EC integration with “Purchasing” to have the greatest importance, followed by “Sales Order Processing” and “Logistics”. This is not surprising, given the nature of their business.

“We have three retail companies, and we need to combine them and have them look like one company, for example, so that we can place one order of jeans from Levi instead of three orders.”  
(\$24B Retail Distributor)

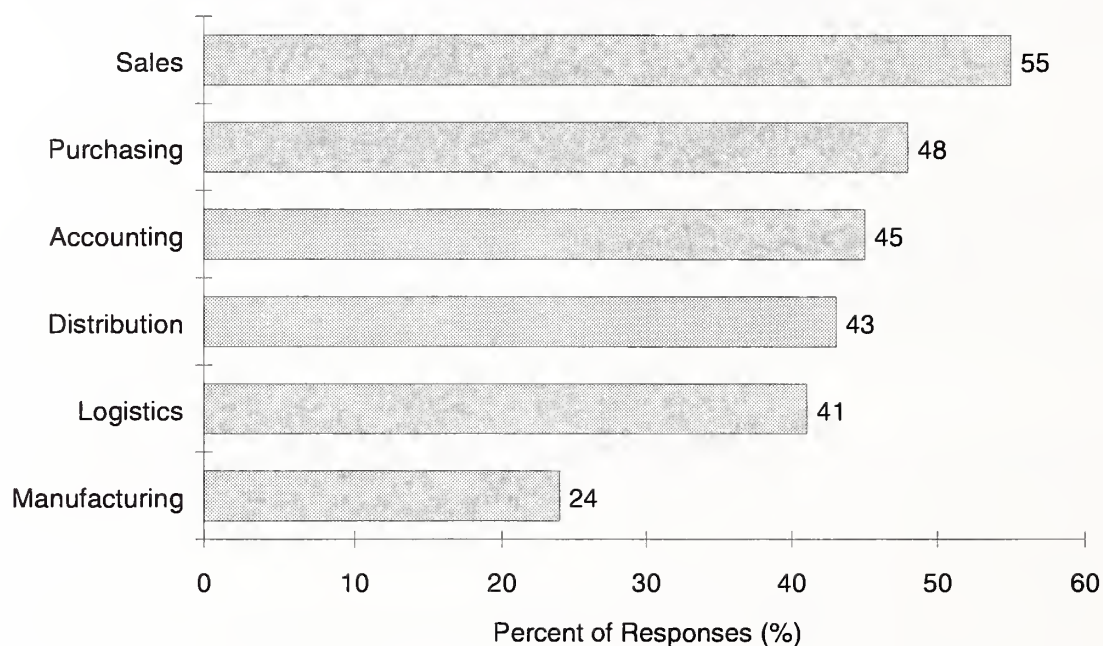
“Integration of PO’s is critical, as is advance ship notices, invoices, sales, inventory.”  
(Retail Distributor)

## 2. Penetration of Electronic Commerce in Business Functions

Exhibit IV-12 shows the areas of their business where electronic commerce is already integrated with business functions.

Exhibit IV-12

### Portion of Business Conducted via Electronic Commerce Retail/Wholesale Trade Industry



Source: INPUT

Consistent with the general user population, "Sales Order Processing" was the primary business function already integrated. And not surprising - "Purchasing" ranked higher than "Accounting" for those already being integrated.



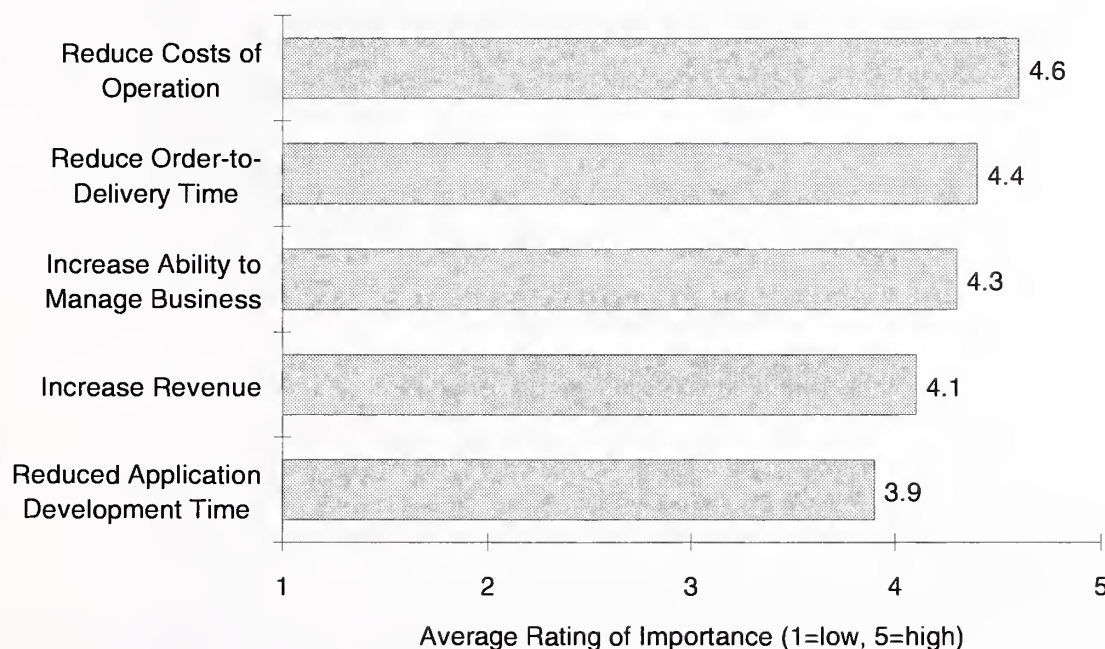
### 3. Integration Objectives

In this area, retailers were consistent with the overall user population in ranking “Reduction in Costs of Operation” and “Reduction in Order-to-Delivery Time” as the two most important objectives to be achieved.

Exhibit IV-13 shows how these users ranked integration objectives.

Exhibit IV-13

#### Importance of User Objectives from EC/EAS Integration Retail/Wholesale Trade Industry



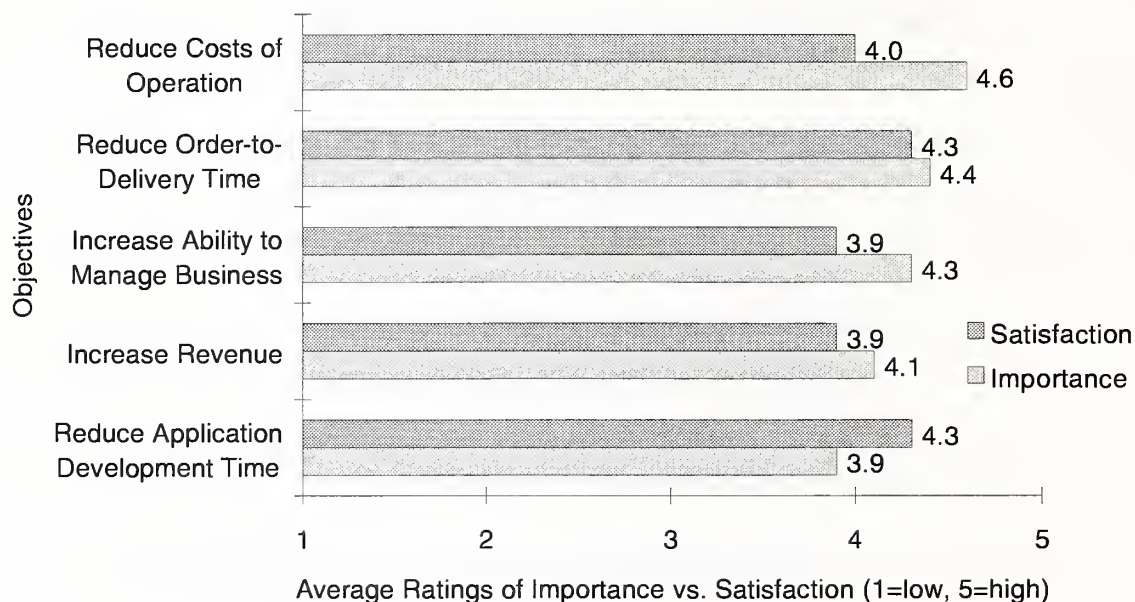
Source: INPUT

### 4. User Satisfaction with Integration

Exhibit IV-14 identifies the importance of expected benefits associated with integrating electronic commerce and enterprise applications, and the associated satisfaction with realizing these benefits.

Exhibit IV-14

### Importance and Satisfaction with Integration Objectives Retail/Wholesale Trade Industry



Source: INPUT

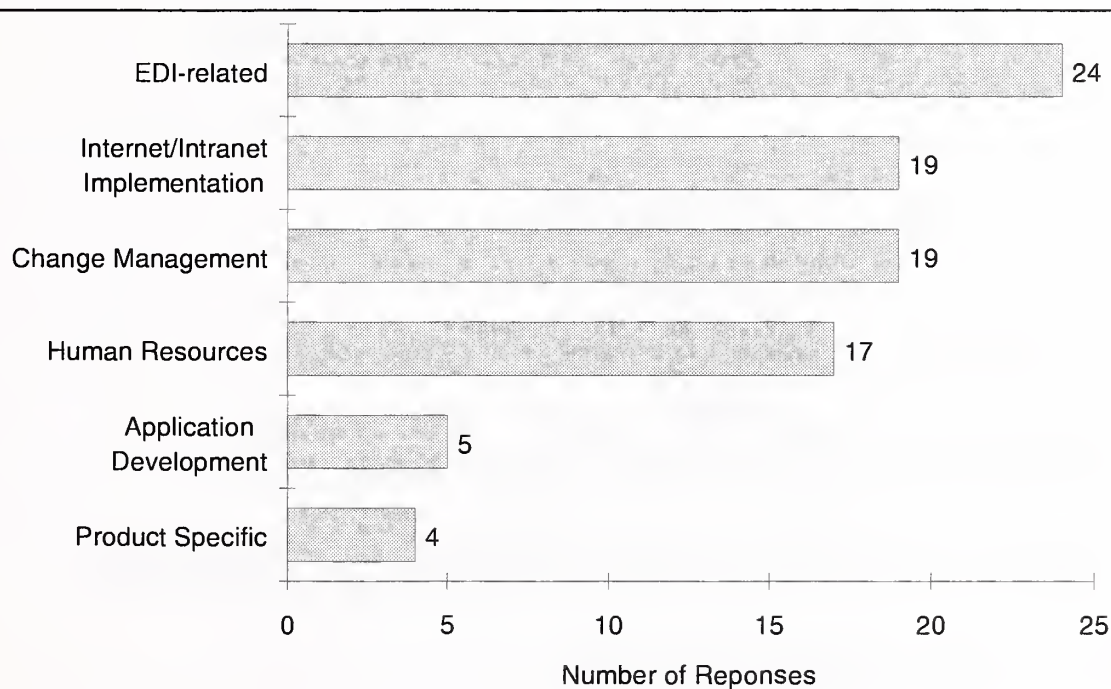
This group clearly did not believe that they had “Reduced Costs of Operation”. It is possible that this was an unrealistic expectation, considering that for the most part the entire retail distribution channel operates on extremely thin margins.

#### 5. Areas Where Users Need Assistance

Exhibit IV-15 identifies areas where users felt they needed the services of external vendors.

Exhibit IV-15

### Unmet User EC/EAS Needs Retail/Wholesale Trade Industry

*Source: INPUT*

These users expect to use outside resources for “EDI” functions more than any other area. This is probably because EDI is so important to this group, for functions such as quick response, integration with bar-coding, vendor managed inventory, etc.

The next two important areas, “Internet” and “Change Management” ranked higher than the user population overall, which ranked “Product Specific Skills” as the area where vendor assistance was most needed.

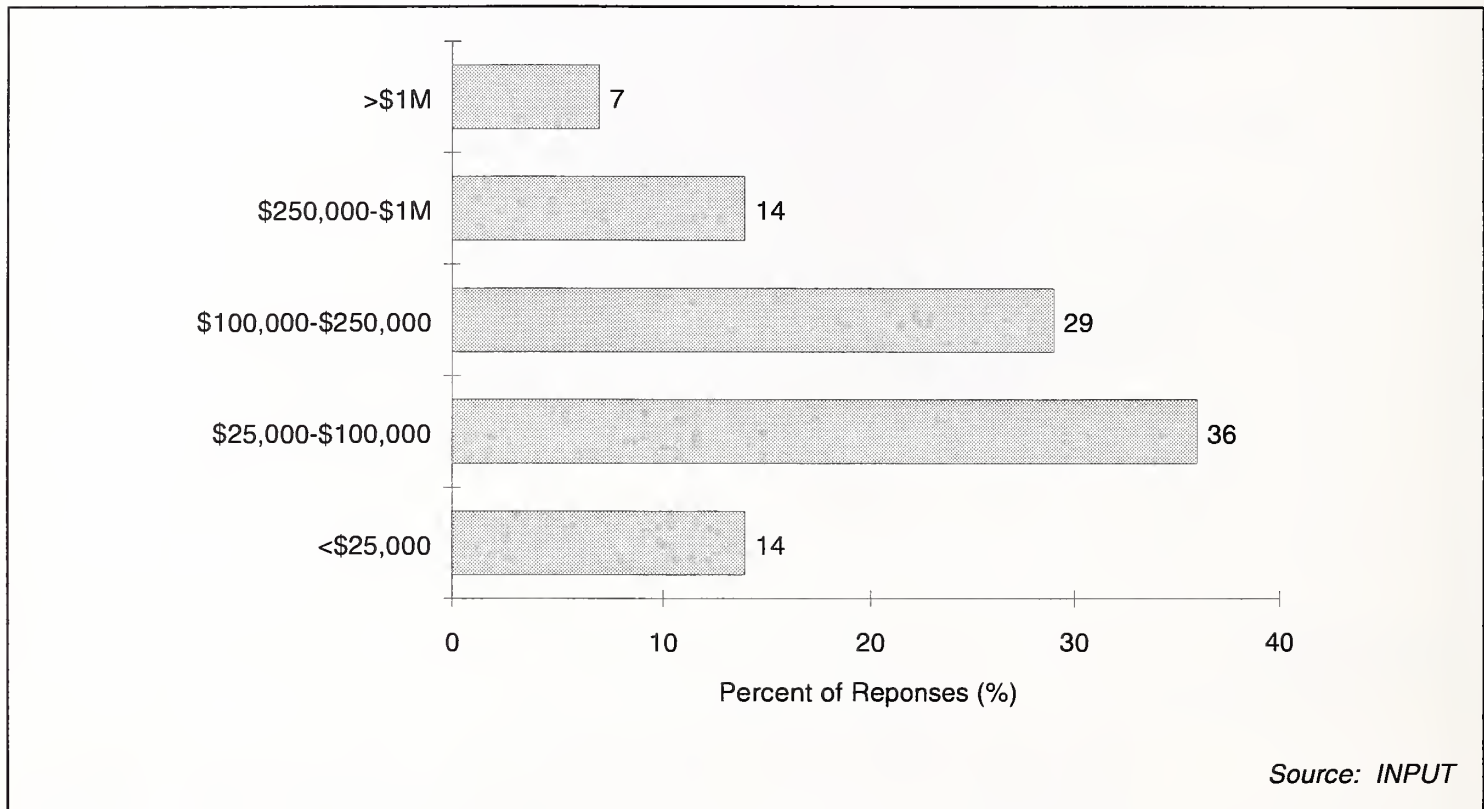
This is a clear opportunity where EDI vendors need to be aggressive. EDS was the vendor most mentioned by this group as being able to handle all of the above areas.

## 7. Costs of Integration

Exhibit IV-16 shows the range of expenditure amongst this group of users.

Exhibit IV-16

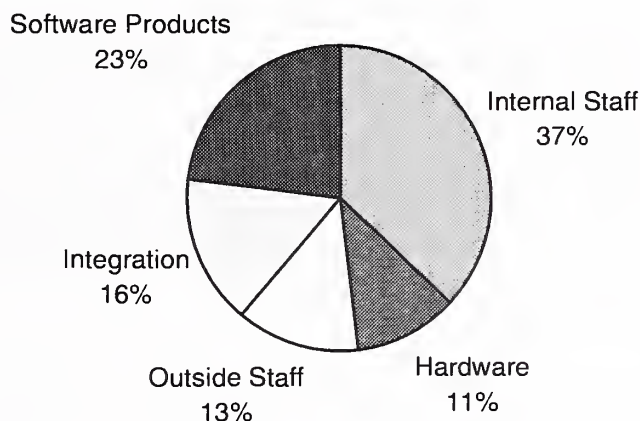
### Total Expenditures for EC/EAS Integration Retail/Wholesale Trade Industry



These users have spent far less than the population overall – 80% spent less than \$250,000 on integration of EC and EAS. This is probably due to the fact that this group had budgeted far less on “external staff” than the rest of the users, as is shown in Exhibit IV-17.



## Exhibit IV-17

**Budget Allocations for EC/EAS Integration  
Retail/Wholesale Trade Industry***Source: INPUT*

Like the population overall, this group expects to spend more than 50% of their budgets on external vendors, but the allocations are different.

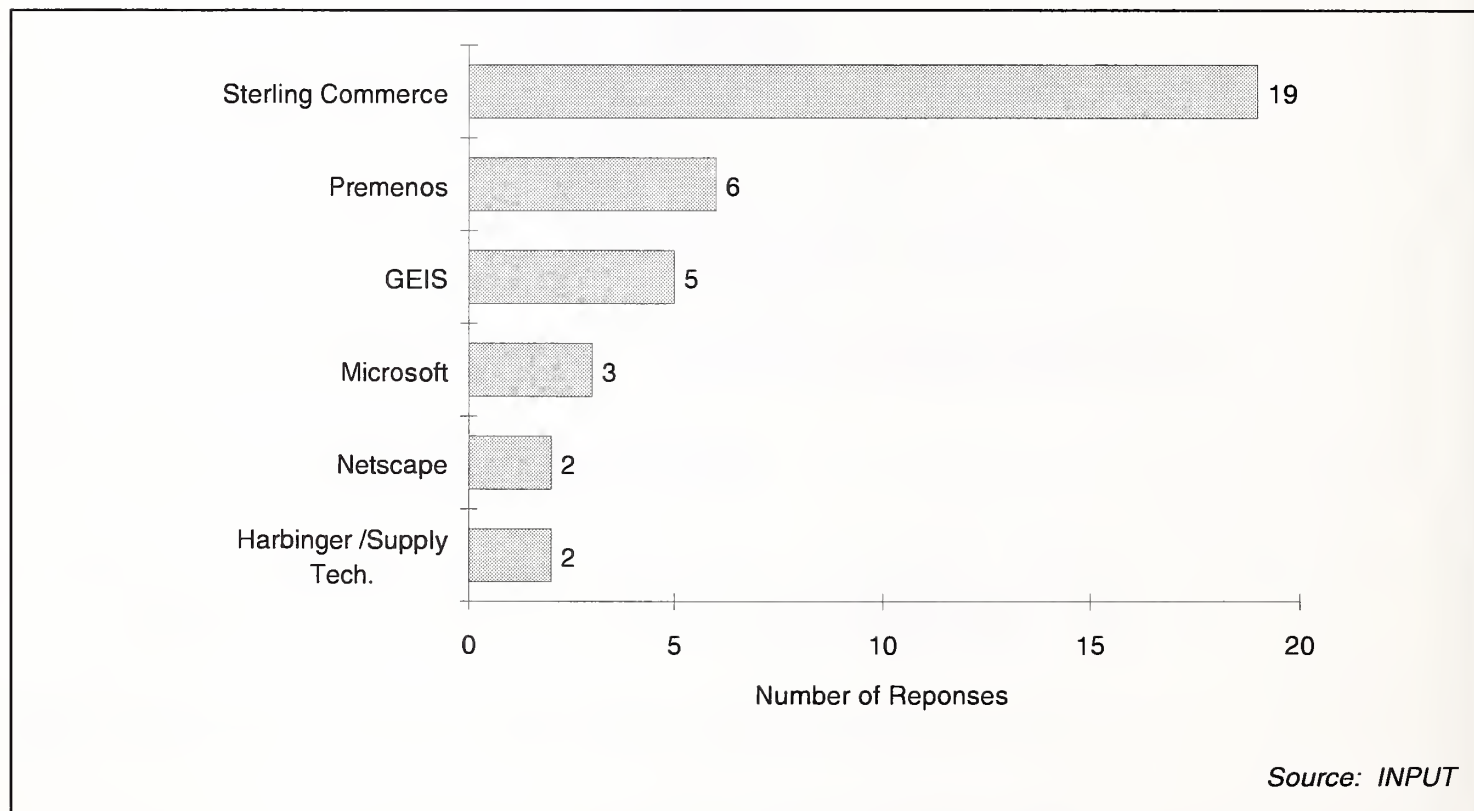
- This group expects to use internal staff more, with a budget allocation of 37%, versus the overall population, which allocated 28% of their budget.
- They expect to spend less for external staff (13%) versus the overall population (21%).
- This group allocates more to software (23%) versus the overall population (17%).
- The amount allocated to integration is about the same as the overall population.

## 8. Leading Products and Services Vendors

When asked which of the following technology vendors they anticipated using over the next three years for “electronic commerce” applications, Sterling was the clear leader, as is shown in Exhibit IV-18.

Exhibit IV-18

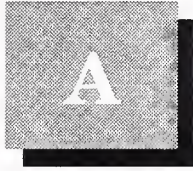
### Most Often Mentioned Electronic Commerce Product Vendors Retail/Wholesale Trade Industry



Users in the retail distribution industry appear to be very familiar with Sterling Commerce – possibly because Sterling Commerce has focused on this market.

They do not appear to be as familiar with other types of vendors as with EC software product vendors:

- Oracle and PeopleSoft were the only EAS vendors to receive more than one or two mentions.
- IBM and Sterling Commerce were mentioned as integration services vendors.



# Impact of Electronic Commerce on Enterprise Applications Questionnaire

## Introduction

1. Do you use electronic commerce in your business? Yes/No\_\_\_\_\_

**If NO, then terminate interview**

2. Does your company use any enterprise-wide management applications in any of the following functions and which vendor's software do you use?

Business Functions	Use EAS software (Y/N)	Vendor
Sales Order Processing		
Purchasing		
Accounting		
Manufacturing		
Distribution		
Logistics		
Other Function ( )		
Other Function ( )		

Comments:

3. Is electronic commerce integrated with the enterprise applications?

\_\_\_\_\_ YES — Please describe the integration then go to question **U1**

\_\_\_\_\_ PLANNED — Please describe the proposed integration and when it will be implemented then go to question **P1**

\_\_\_\_\_ NO — Please comment on why these will not become integrated (**Terminate the interview**)



## Users Who Have Integrated Electronic Commerce and Enterprise Application Solutions

### U1. Electronic Commerce Usage

In which of the following functional areas do you process electronic commerce transactions?

Functional Area	Yes/No	Type of Transaction
Purchasing		
Sales Order Processing		
Accounting		
Accounts Receivable/Billing		
Production Planning		
Logistics		
Other		
Other		

Comments:

**U2. Impacted Business Functions and Processes**

Please rate, on a scale of 1-5 (where 1 = low and 5 = high), the importance to the following business functions and processes of integrating enterprise applications with electronic commerce.

<b>Business Process/Function</b>	<b>Rating of Importance (1=low, 5=high)</b>
Purchasing	
Sales Order Processing	
Accounting	
Accounts Receivable/Billing	
Production Planning	
Logistics	
Other( )	
Other( )	

Comments:

### U3. Integration Objectives

Please rate on a scale of 1 to 5 (where 1 = low and 5 = high), the importance of each of the following objectives when integrating electronic commerce and enterprise applications. Also rate how satisfied you are that these objectives have been met.

Objective	Importance Rating (1=low, 5=high)	Satisfaction Rating (1=low, 5=high)
Reduce application development time		
Reduce costs of operation		
Reduce order-to-delivery time		
Increase revenue		
Increase ability to manage business		
Increase Revenue		
Reduce Application Development Time		
Other		
Other		

Please comment on any areas of low and high satisfaction (i.e. rated as 1/2 or 4/5).

**U4. Technology Direction**

Which of the following roles do people in the functional areas play in the definition of technology direction?

Role	Yes/No
Responsible for the direction	
Advise on technologies	
Submit business requirements	
Other - please describe	

Is there someone in the functional areas that is responsible for the integration of electronic commerce? Y/N \_\_\_\_\_

Please describe the position and title that they usually have.

Title:

Description



**U5. Technology Vendors**

Which of the following technology vendors do you anticipate using for electronic commerce applications in the next 3 years?

<b>Technology Vendor</b>	<b>Expect to Use (Y/N)</b>	<b>Products (if known)</b>
Netscape		
Microsoft		
Sterling Commerce		
Harbinger		
Lotus		
Premenos		
St.Paul Software		
Open Market		
Other ( )		
Other ( )		

Comments:

**U6. Skill Requirements**

What skills do you believe are required for this type of integration and will you use in-house resources or an external vendor to supply those skills?

<b>Skill</b>	<b>Required (Y/N)</b>	<b>In-house (I) or External Vendor (E)</b>	<b>Possible Vendor</b>
Application Development			
Change Management			
Human Resource			
Internet/Intranet Implementation			
EDI-related			
Product specific (Product )			
Product specific (Product )			
Product specific (Product )			
Other			
Other			

Comment:

**U7. Vendors**

Who do you believe are the 3 leading vendors of EC software products, EAS software products and EC/EAS integration services? Which vendor(s) do or did you use?

Code	Leading Vendor Name	Use Y/N
	EC Software Product Vendor	
EC1		
EC2		
EC3		
	EAS Software Product Vendor	
EAS1		
EAS2		
EAS3		
	Integration Service Vendor	
INT1		
INT2		
INT3		

Comment:

**U8. Further Integration**

Please describe any additional integration of EC and EAS you would like to accomplish. Indicate those areas in which you may be seeking assistance from vendors in performing this work?

**U9. Lessons in hindsight**

Is there any aspect of the integration that you would do differently if you had to go through the exercise again and what would you change?

1.

2.

3.

**U10. Advice to Vendors**

Is there any advice or suggestions for improvement that you would give to vendors regarding their way of doing business, product offerings or service portfolios?



**U11. Mix of Integration Costs**

What is the relative proportion of costs associated with integrating electronic commerce and enterprise applications?

Area of Expenditure	Portion of Cost (%)	Comment
Software Products		
Integration Services		
Hardware		
Internal IT Staff		
Internal non-IT staff		
Other		

What is your estimate of the total amount your company spent on this integration activity?

Absolute - \$ \_\_\_\_\_

Range - Less than \$25K

\$25K-100K

\$100K-250K

\$250K-\$1M

Over \$1M

Comments on costs:

**U12. Other Comments**

Do you have any other comments you would like to make regarding the impact of electronic commerce on enterprise applications?

Thank you — Check name and address for Executive Overview

## Users Who Plan to Integrate Electronic Commerce and Enterprise Applications

### P1. Electronic Commerce Usage

In which of the following functional areas do you process electronic commerce transactions?

Functional Area	Yes/No	Type of Transaction
Purchasing		
Sales Order Processing		
Accounting		
Accounts Receivable/Billing		
Production Planning		
Logistics		
Other		
Other		

Comments:

**P2. Impact on Business Functions and Processes**

Please rate, on a scale of 1-5 (where 1 = low and 5 = high), the importance to the following business functions and processes of integrating enterprise applications with electronic commerce.

<b>Business Process/Function</b>	<b>Rating of Importance (1=low, 5=high)</b>
Purchasing	
Sales Order Processing	
Accounting	
Accounts Receivable/Billing	
Production Planning	
Logistics	
Other ( )	
Other ( )	

Comments

### P3. Integration Objectives

Please rate on a scale of 1 to 5 (where 1 = low and 5 = high), the importance of each of the following objectives when integrating electronic commerce and enterprise applications.

Objective	Importance Rating (1=low, 5=high)
Reduce application development time	
Reduce costs of operation	
Reduce order-to-delivery time	
Increase revenue	
Increase ability to manage business	
Other	
Other	

Comments



**P4. Technology Direction**

Which of the following roles do people in the functional areas play in the definition of technology direction?

Role	Yes/No
Responsible for the direction	
Advise on technologies	
Submit business requirements	
Other - please describe	

Is there someone in the functional areas that is responsible for the integration of electronic commerce? Y/N \_\_\_\_\_

Please describe the position and title that they usually have.

Title:

Description

**P5. Technology Vendors**

Which of the following technology vendors do you anticipate using for electronic commerce applications in the next 3 years?

<b>Technology Vendor</b>	<b>Expect to Use (Y/N)</b>	<b>Products (if known)</b>
Netscape		
Microsoft		
Sterling Commerce		
Harbinger		
Lotus		
Premenos		
St.Paul Software		
Open Market		
Other( )		
Other ( )		

Comments:

**P5. Skill Requirements**

What skills do you believe are required for this type of integration and will you use in-house resources or an external vendor to supply those skills?

<b>Skill</b>	<b>Required Y/N</b>	<b>In-house (I) or External Vendor (E)</b>	<b>Possible Vendor</b>
Application Development			
Change Management			
Human Resource			
Internet/Intranet Implementation			
EDI-related			
Product specific (Product )			
Product specific (Product )			
Other			
Other			

Comments:

**P6. Vendors**

Who do you believe are the 3 leading vendors in the EC software product market, EAS product market and market for EC/EAS integration services?  
Which vendor(s) do you plan to use?

Code	Leading Vendor Name	Use (Y/N)
	EC Software Product Vendor	
EC1		
EC2		
EC3		
	EAS Software Product Vendor	
EAS1		
EAS2		
EAS3		
	Integration Service Vendor	
INT1		
INT2		
INT3		

Comments:

**P7. Prospect Concerns**

What concerns do you have (if any) regarding the integration of EC and EAS?  
What steps have been taken to avoid these potential problems?

Concerns:

1.

2.

3.

Steps:

1.

2.

3.



**P8. Mix of Integration Costs**

What do you expect to be the relative proportion of costs associated with integrating electronic commerce and enterprise applications?

Area of Expenditure	Portion of Cost (%)	Comment
Software Products		
Integration Services		
Hardware		
Internal IT Staff		
Internal non-IT staff		
Other		

What is your estimate of the total amount your company will spend on this integration activity?

Amount - \$\_\_\_\_\_

Range - Less than \$25K

\$25K-100K

\$100K-250K

\$250K-\$1M

Over \$1M

**P9. Other Comments**

Do you have any other comments you would like to make regarding the impact of electronic commerce on enterprise applications?

Thank you





